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Professional

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- REELING IN THE DATA
- STRATEGIC DIRECTIONS: KNOWLEDGEWARE ON TARGET WITH HP-UX

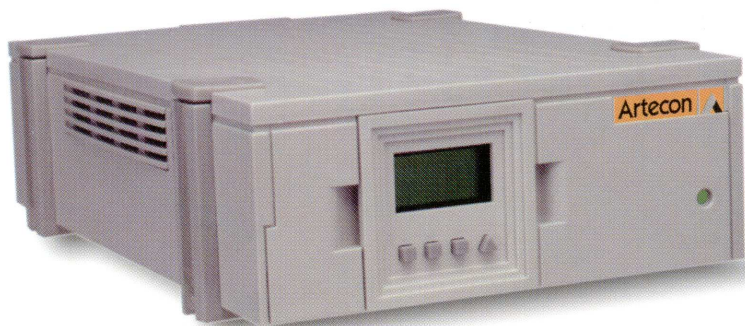
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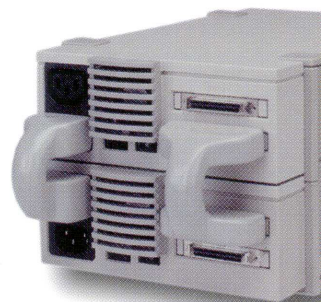
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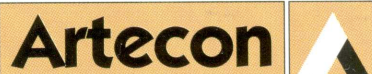
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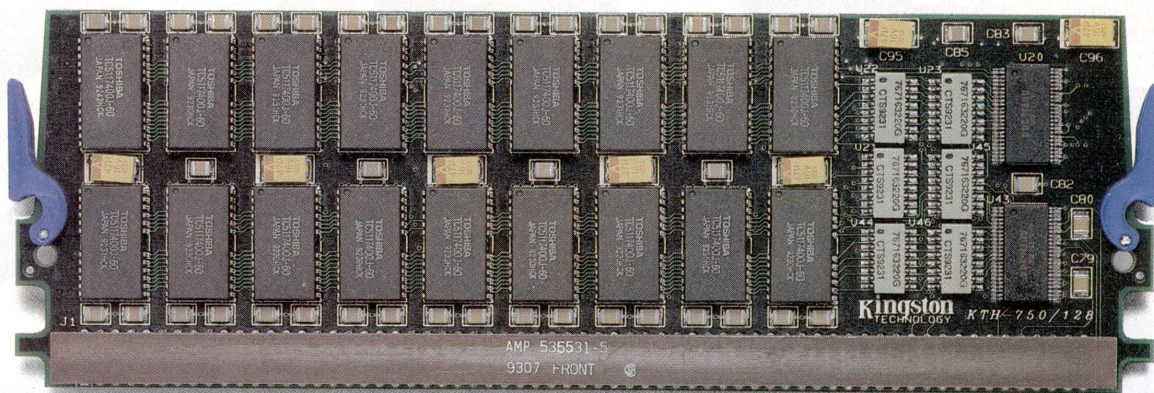


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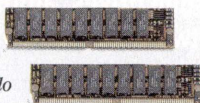
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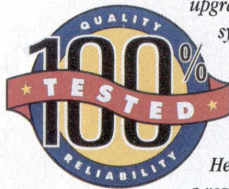
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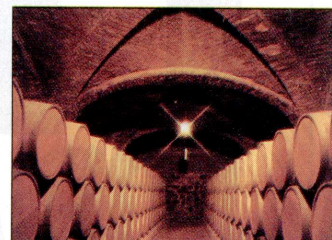
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VBPA ABP

Chip, Chip, Hooray!

As HP Rises To The Top, It Must Remember How It Got There

"Face it, Santa Claus has had more publicity," writes a zealous Linus when consoling the Great Pumpkin in the Peanuts Halloween special. He then encourages the Great Pumpkin with, "But being number two, perhaps you try harder!" Charlie Brown simply attributes Linus' almost fanatical devotion to "obvious denominational differences."

Now that HP has been deemed "America's Number Two Computer Company," they appear to be heeding Linus van Pelt's advice to try harder. HP, like other companies, realizes that the fanatical evangelists once dedicated to a product or company are losing their religion, with the denominational differences blurring into a church of harmonic convergence.

In an unprecedented move, HP went public with a five-year technology commitment. Announced at the end of last year, HP plans to base its product development on the PA-RISC chip 7100LC. Why is HP disclosing its plans? According to HP's Jan Silverman, marketing manager for Advanced Technologies, CSO, "In this day of open systems, the reality is that when a customer buys into a company, they want to be sure that that company will be offering competitive products five years from now."

HP introduces the 7100LC chip hoping to provide solutions from the desktop to the high end. The new systems are primarily targeting the low-end, traditional midrange systems and the high-end PC, in particular Intel's Pentium, IBM's Power PC and DEC's Alpha technologies.

The question HP users and potential customers now face is whether or not HP is really committing to its customers' specific needs and not just settling in behind a veneer of land speed records. The challenge for HP is not to stop after just one chip, and apparently HP doesn't plan to. As DEC can now attest, having the fastest chip doesn't mean having the best solutions.

To address this challenge, HP is offering more than a quick chip-fix across its product lines including the HP 3000, HP 9000 and workstations. And well it should, because today's gimlet-eyed customers have a choice and they know it — especially the HP 3000 user.

"HP is fundamentally changing how we do business," says Glenn Osaka, general manager for HP's Computer Systems Division. According to Osaka, the HP 3000 technicians and engineers, conscious of their growing reputation of not being in touch with its user base, are doing an about-face.

In order to understand its users, HP's R&D teams are being assigned specific customers to experience the real-world needs of businesses when developing and enhancing products.

Osaka has hypothesized that there are four groups of users: "those retaining their ways, those advancing in systems integration, those concerned with mission critical and, finally, those who are evolving applications." Osaka cites the HP 3000 newsletter, audio and video conferences and how attitudes are changing in and around HP labs as HP now tunes into these groups of users.

Once only concerned with technology, lab personnel are now discovering how HP customers use the products. Osaka maintains this allows for the return of the creative engineer. For example, he explains that the spooler problem, which traditionally has been a low priority technology in the lab, was addressed once technicians realized how frustrated end users actually were.

Osaka also assures those jaded by promises of a better order fulfillment solution that order fulfillment is a "pervasive issue" at HP, which is being addressed on its own time scale.

As far as new iron announcements go, the HP 3000 Corporate Business System 995, recently expanded from four- to eight-way symmetrical multiprocessing, uses 2-CPU-per-board implementation of the PA-RISC 7100 processor. Software improvements such as HP's client-server applications for the HP 3000 include new manufacturing software and application products from Ask, Oracle, Spectrum, Ross Systems, SAP, Mitchell Humphrey, PeopleSoft, Computron, FileNet and Wang.

Although Osaka says individual customers are already seeing a positive change in HP's attitude, he expects the proof of a significant turnaround will be seen in about a year. HP is definitely taking a step in the right direction, as long as it follows through and doesn't waffle once the ruck of announcements ends, leaving its users shivering in the pumpkin patch.



By Charlie Simpson

Three For Networking

At Comnet in Washington, D.C. this past December, HP show-

ed off its plans for three networking technologies that it hopes will evolve in concert into the transport modes of choice for your favorite bits and bytes.

- 100Base Voice Grade (100Base VG)
- Asynchronous Transfer Mode (ATM)
- Fibre Channel

Each of these has a different networking strength that is best suited to the

different problems you may face in your networking future.

100Base VG is a straightforward extension of today's 10Base-T Ethernet networking standard (802.3). By using the 10Base-T infrastructure, the Ethernet frame and following the Ethernet topology rules, HP says 100Base VG will be transparent to current network operating systems and application software. 100Base VG would be the link to most desktop systems for the near term providing a low-cost local networking alternative.

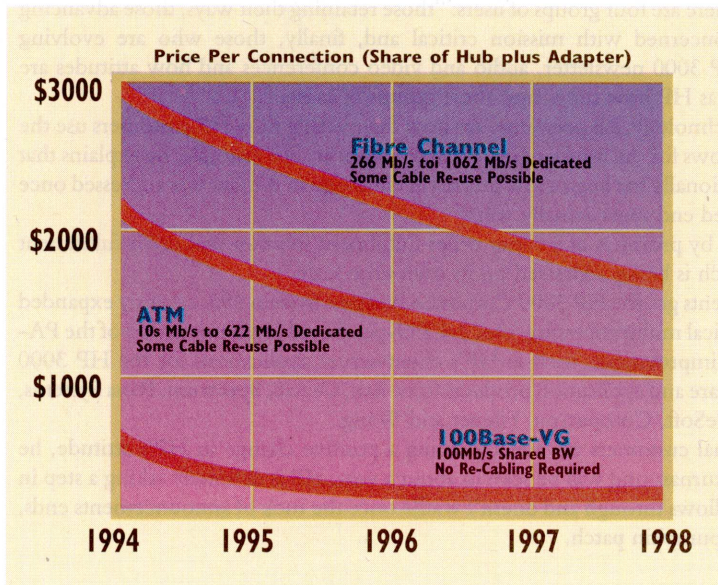
Capable enough to support some multimedia applications and scalable enough to simulate a backbone structure through cascading, the 100Base VG architecture would include a 100 Mbps shared bandwidth packet switch with demand priority hub arbitration. For most users, 100Base VG would be the best local workgroup networking solution.

ATM is the next step up in HP's vision of the networking hierarchy of the future. This networking scheme defines data in packets or cells of 53 bytes each, and moves the cells in a method called cell relay. The small cell size makes this technology a natural for multimedia applications, where bursts of high-density data are the rule.

ATM provides full bandwidth to every user and works well with LAN, WAN, MAN and ISDN schemes, which is not true in most other networking concepts. This means ATM can more easily tie together existing networks.

"ATM can scale up from the desktop to the enterprise level," says Kevin Faulkner, HP's U.S. ATM marketing

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program manager. He notes that the backbone saturation problem plaguing many firms, where the rising tide of network data overwhelms networking systems, can benefit from ATM's scalability both in size and speed.

Speeds with ATM begin at 51 Mbps and will scale to 2.4 Gbps and beyond over cables ranging from unshielded

twisted pair to fiber optics. Jean Jacques Ozil, HP worldwide ATM product marketing manager, notes, "ATM is biased toward WAN, so it makes a perfect enterprise backbone."

With 100Base VG providing local workgroup links for up to a hundred or so users, and ATM providing higher-performance desktop links and the long-term

backbone for the network, what is missing is a very high-capacity, short-distance link. Enter Fibre Channel.

Fibre Channel has great appeal for applications such as mass storage, computer clusters and high-end applications such as medical imaging that demand large volumes of data to be moved rapidly.

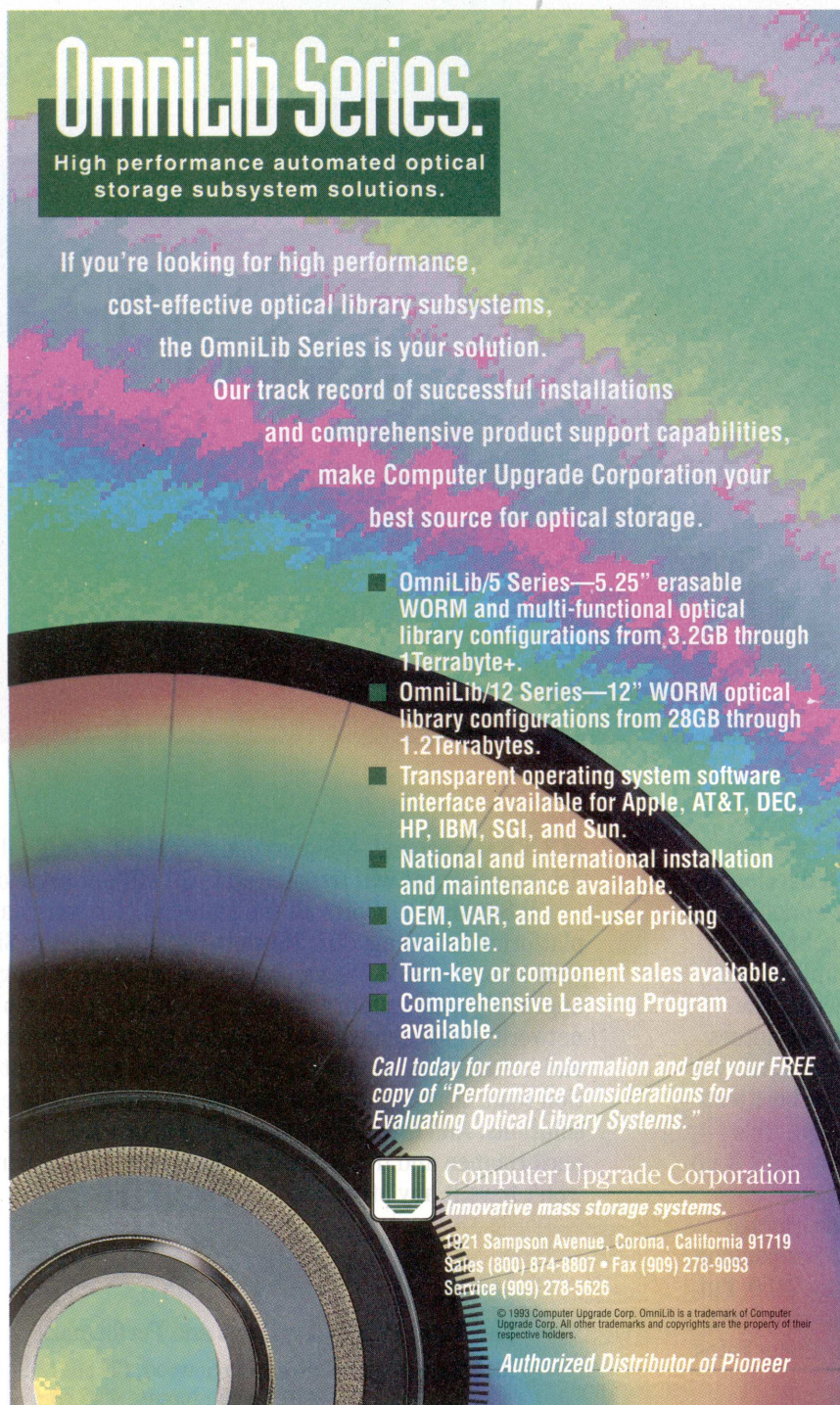
HP's Wilson says Fibre Channel will be available this year with 266 Mbps capacity, and next year will jump into the Gbps range. "It is possible to move 60,000 pages in one second with Fibre Channel, which is 10 to 100 times faster than anything you can do today," says Wilson.

There are costs, of course. By HP estimates, the price per connection will be \$400 for 100Base VG, \$2,200 for ATM and \$3,000 for Fibre Channel. By 1998, HP expects each of these costs to be reduced by half.

**"It is possible to
move 60,000 pages in
one second with Fibre
Channel, which is 10 to
100 times faster than
anything you can do
today."**

HP expects to be a full participant in all three of these technology areas, but may be particularly competitive with Fibre Channel, an area in which HP has considerable expertise. For now however, as costs drop, HP will work to make 100Base VG, ATM and Fibre Channel industry standards. ■

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==>
String found 14 Text /etc/profile "PATH" Hint: press Enter to save edits
-4-
-3-
-2-
-1-
*
+1- trap "" 1 2 3                # ignore HUP, INT, QUIT now.
+2-
+3- PATH=/bin:/usr/bin:/usr/contrib/bin:/usr/local/bin:  # default path.
+4- MANPATH=/usr/man:/usr/contrib/man:/usr/local/man      # default path
+5-
+6- if [ -r /etc/src.sh ]
+7- then
+8-     . /etc/src.sh                # set the timezone
+9- else
+10-    unset SYSTEM_NAME
+11-    TZ=MSI7MDT                    # change this for local time.
+12-    export TZ
+13- fi
+14-
+15- if [ "$TERM" = "" ]
+16- then
+17-     TERM=hp                      # default the terminal type
+18- fi
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HOW TO UNRAVEL THE CLIENT/SERVER MYSTIQUE.

First, accept that there is no mystique. Rather, there are hordes of slightly frantic software companies content to have you believe that effective open system solutions remain elusive while they rush to understand, develop, and market their interpretation of client/server. Then there's Lawson Software.

An Open Systems Foundation



At Lawson Software, we've been committed to open systems since our company was founded in 1975. We've always believed that

to be a valuable business partner, an applications provider must offer choices for business strategy development. So for us, client/server isn't a new phenomenon. Instead, it's the next logical step in our development. And it exists today – fully developed and fully functional – in the latest release of our enterprise-wide, cross-industry, world-class business application software.

A True Client/Server Solution

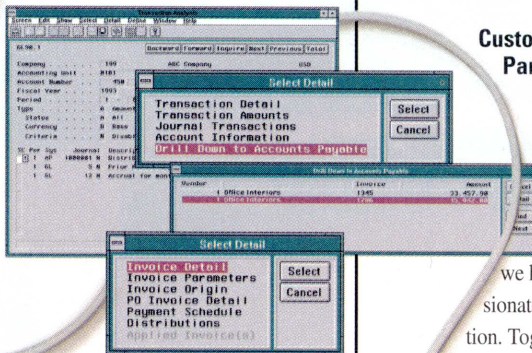
The truth is, client/server takes on a special meaning for each individual business computing environment. That's why we've structured our client/server solution as a comprehensive 3-tier architecture, delivering you maximum flexibility in hardware, database and user interface. It's why Lawson's products run across platforms like the AS/400 as well as UNIX systems such as the RS/6000 and HP9000. And it's also why we feature seamless support for a variety of leading databases. In short, we offer options that allow you to make the decisions. Based on your

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Lawson's efficient use of technology leads to a system with the scalability demanded in today's changing world.

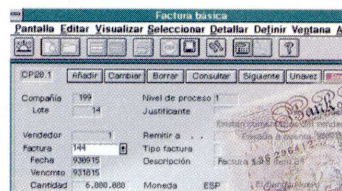
We incorporate the latest GUI technologies, creating a user-friendly environment that reduces training time. Individual users can manipulate windows, icons and tool bars to create a personal work environment that increases productivity. In addition,



Lawson has revolutionized the way users access information with our comprehensive "drill-around" capability: now a single click of the mouse allows transparent access to data from multiple applications and platforms. And finally, to truly maximize your options, Lawson has maintained the ability to interface our applications using character-based terminals.

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Lawson's single, worldwide product set – featuring all the freedom of our flexible client/server architecture – means the ultimate in simplicity for large, international



companies functioning in a variety of intra-national markets. You'll find capabilities like support for multiple languages, currencies, tax codes and rates, as well as a variety of date and reporting formats. So whether your business is managing one site or sites around the globe, you can turn to Lawson Software for one total solution.

Customer-Focused Partnership

Lawson Software has always been focused on leading edge technology. And we have always been passionate about client satisfaction. Together, these two commitments have resulted in truly flexible business solutions created with your needs in mind. We'd like the chance to demonstrate this to you. You'll see how – from our system architecture to

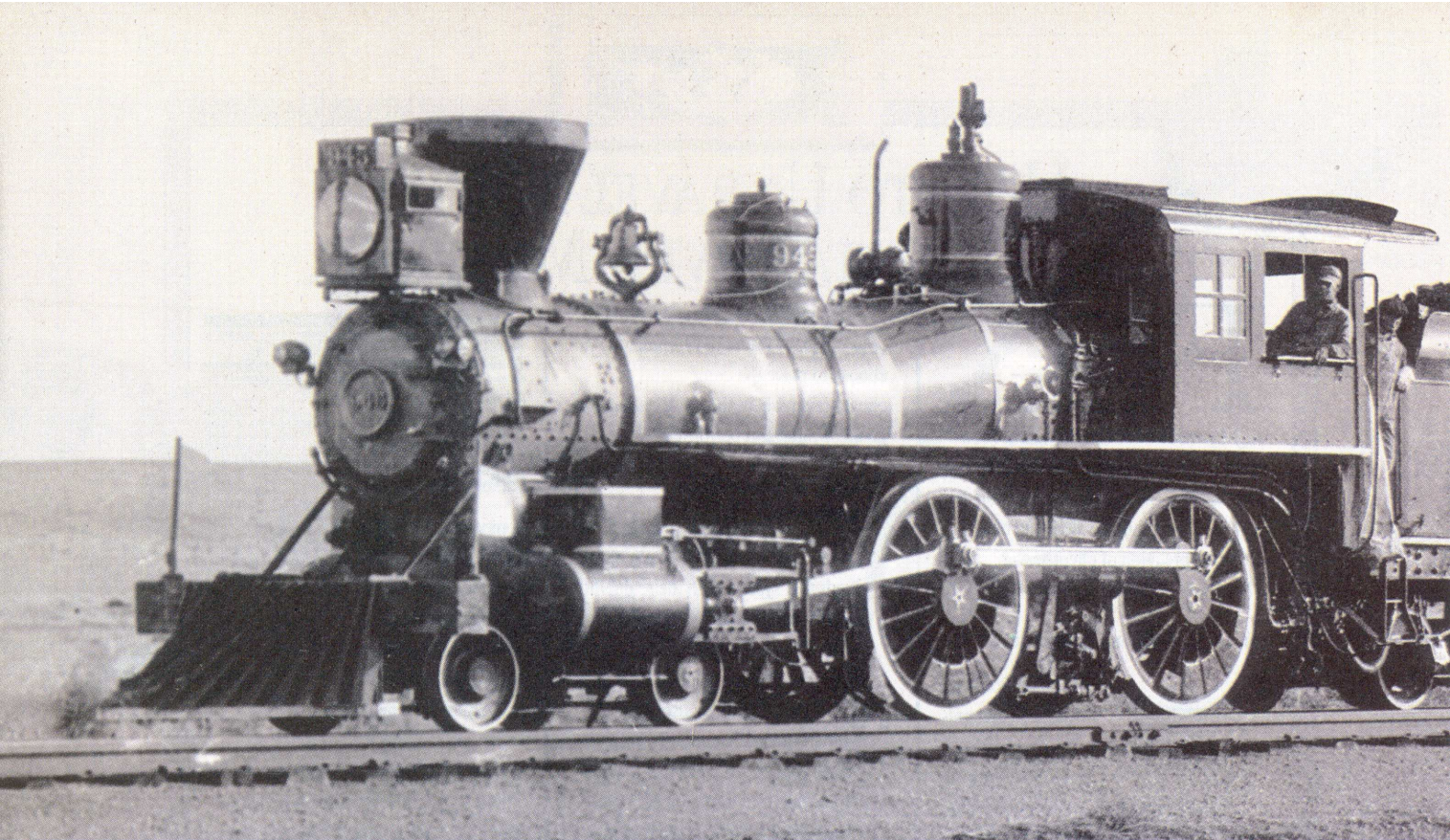
our award winning client services – Lawson Software really does unravel the client/server mystique.

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IMAGE/SQL And Much More

The screenshot shows two overlapping windows from the Adager HP3000 software. The background window is titled 'Adager HP3000 Data Base Display' and contains a table with columns: Data Base Name, Creator, Create Date, Modify Date, Total MB, DBUTIL Da, and Flags. It lists various databases like DASHOT, BARUC, CUST, QCDEND, QCDICT, ALARM, and TORDIR. The foreground window is titled 'Dataset Paths Display' and shows a table with columns: Dataset Name, Associated Master, Average, and Chain. It lists datasets like AUTO-DATE, AUTO-COA-ACCT, AUTO-PERIOD, and AUTO-REF-HD.

ADAPTER MANAGER FOR IMAGE

- Full support for IMAGE/SQL
- Information is available in tabular or graphical form
- Model 1, \$2,300
Model 2, \$7,500

The Adager Corp.

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Circle 354 on Reader Card

Since 1978, Adager, the Adapter/Manager for IMAGE from The Adager Corp. (Sun Valley, Idaho), has been an indispensable tool for thousands of HP 3000 sites. As IMAGE has been enhanced and the needs of HP 3000 users have changed, Adager has kept pace. With IMAGE/SQL support, the Adager Database Console (ADC) and other enhancements, Adager helps users meet challenges and exploit opportunities.

The latest Adager release provides the ADC; support for databases indexed by either Omnidex or Superdex under the Third-Party Indexing (TPI) interface; the ability to redefine a group of fields; support for Dynamic Detail Dataset Expansion (MPE/iX 5.0); and Native Mode MAST-CAP.

Alfredo Rego, president of Adager, is particularly pleased with rollback recovery after what he refers to as a "resource crisis" like insufficient disk space. Despite clear warnings, many users attempt transformations without having a good backup available. Rego says Adager's new recovery capabilities should eliminate many support calls.

The importance of IMAGE/SQL support is obvious if you have already enabled several production IMAGE databases for SQL access. IMAGE/SQL creates tables of mapping information about each database and its SQL-authorized users. But, there are incompatibilities between what IMAGE allows and the SQL standard, and these must be resolved manually with such commands as **UPDATE TYPE** and **SPLIT**. Also, to allow SQL access for other users, **ADD USER** must be performed.

If you need to restructure an IMAGE database, you must first **DETACH** the database from the Database Environment, destroying all the mapping and user information in the process. The commands you enter when you first **ATTACH** a database can be logged to a file, and if this log is retained, it can be **XEQed** when the database is re-**ATTACHED**. This, however, presents maintenance and security problems that multiply with the number of databases. With full IMAGE/SQL support, Adager does everything

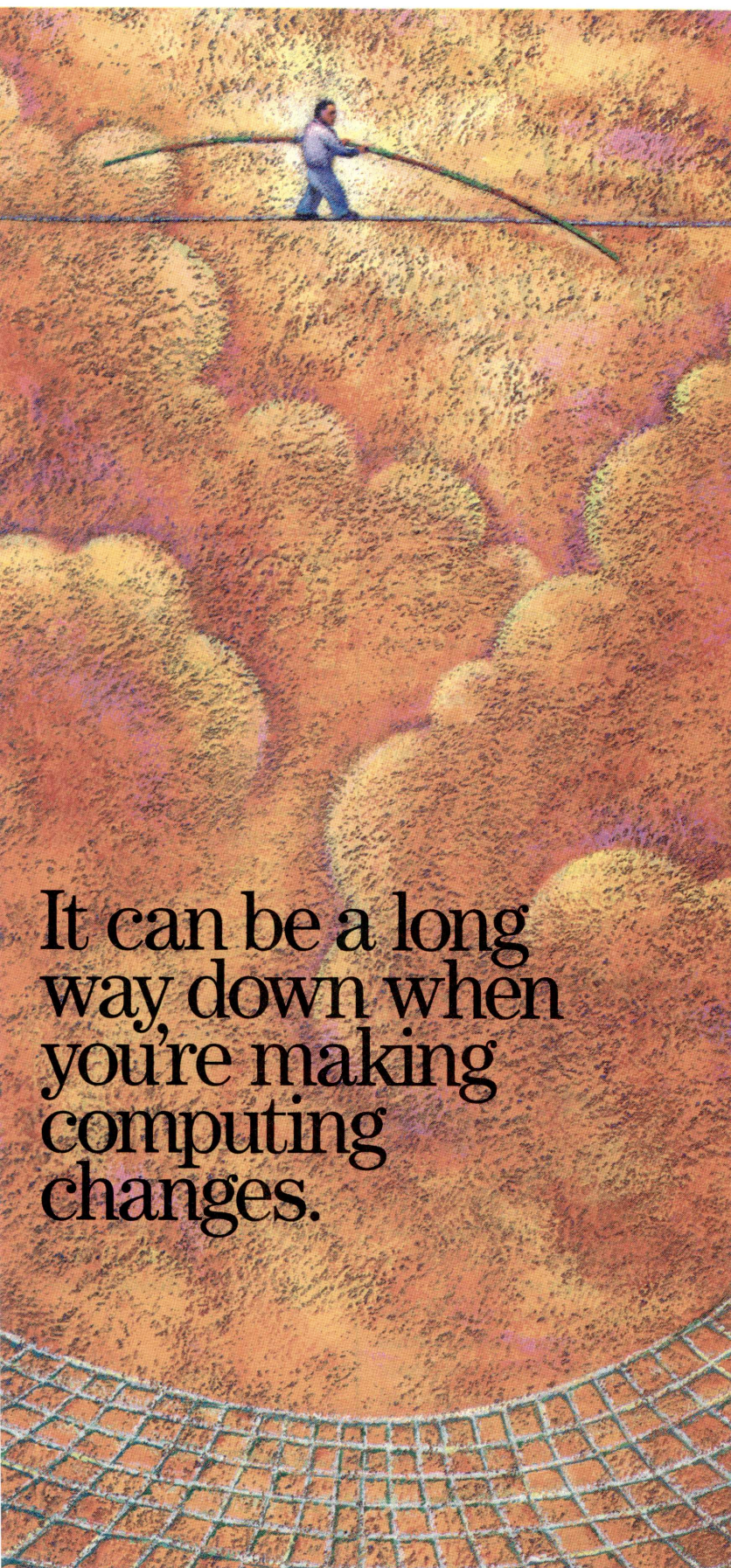
for you automatically. No manual **DETACH** and re-**ATTACH**. And no need to retain a log file. According to Rego, "Adager decompiles all the internal, gruesome binary tables that SQL uses," retaining the information in memory before **DETACH**-ing the database. It then uses this information when the transformed database is re-**ATTACHED**.

The ADC is a client-server tool for monitoring and managing IMAGE databases and disk resources. The client portion runs on a PC with Microsoft Windows and WRQ's Reflection for Windows. The server portion runs on any HP 3000 equipped with Adager. Information is available in tabular or graphical form. Using an expert system and rules you specify, the ADC can automatically define and schedule background Adager tasks to keep your databases within operational specs.

Adager comes in two basic flavors: Model 1, for capacity changes, copying, renaming and detail dataset repacking; and Model 2, which adds restructuring features for sets, items, fields, paths and sort items.

The Adager license plus first year maintenance is \$2,300 for Model 1, \$7,500 for Model 2.

— John P. Burke
HP 3000 Editor



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- ☐ \$5-\$10,000 ☐ \$11-\$50,000
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Timber! End The Paper Lumber

portions of the reports to print. Data can then be downloaded into DOS or Windows applications for easier manipulation. According to Carlos Caballero, Quest's director of product management, VISTA Plus "covers the rest of the cycle after [a report enters] the spooling queue."

Because "spooling queues are intimidating to end users," says Caballero, VISTA Plus uses "folders" (created by an administrator) as holding bins for a group's reports.

Using VISTA Plus' selective distribution, depending on the content and pre-defined security criteria, you can send only the pages that are required for each group or individual to see. Caballero describes it as a "virtual report." For example, "If you only need to see four pages of a 1,000-page report, all you'll see are your four pages." Consequently, VISTA Plus preserves auditing standards, as well as enhancing file security.

Drop-down menus, softkeys and pop-up windows are available to help end users scroll or page through reports.

Multiple indexes can be created and comprehensive searches performed. Also, electronic "Post-it" notes can be attached to a report, for you to add informative comments. You can print a report, parts of it, or a custom view to any printer in your network, including local printers.

Obsolete reports will be auto-

matically compressed and identified for archival storage on tape, optical or magnetic disk devices. When you need to access an archived report, a message is sent to the system operator to mount the correct device.

Caballero notes a change in the kind of audience interested in VISTA Plus, once a feature of NBSpool, VISTA's spooling product. "It's the end user driving the demand for this product," he says. Caballero lists accounting managers inventory control managers, and financial analysts among those looking for products like VISTA Plus.

Future enhancements to VISTA Plus, according to Caballero, will include the ability to use Windows, Macintosh and various UNIX (Motif) clients, as well as servers running MPE or any of a variety of other UNIX variants.

CPU-dependent pricing for MPE/iX ranges from \$4,500 to \$19,000; for HP-UX, from \$1,500 to \$10,000. User-based licensing is also available.

—Deborah Schwartz,
Assistant Editor

- Online viewing saves paper, manual labor and hardware
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- \$4,500 to \$19,000 (MPE/iX); \$1,500 to \$10,000 (HP-UX)

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Circle 355 on Reader Card

Are those production reports that are piling up in and around your office beginning to remind you of the giant Sequoias in California's Redwood National Forest? They are? Admit it: We'd like to believe in the myth of a "paperless office," but the truth is we're gasping for breath in the paper chase. And like it or not, we probably will be for some time to come. But for now, HP 3000 and HP 9000 users can at least breathe easier with VISTA Plus from Quest Software (Newport Beach, Calif.).

VISTA Plus is report management software that allows users to view reports online before deciding how much and which

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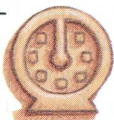


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It's Only Natural

KnowledgeWare And HP Collaborate On Downsizing And Rightsizing Solutions



"So instead of just deploying applications to an HP environment users can develop in an HP environment."

Mike Ciocia
Senior Marketing Director
KnowledgeWare Inc.

KnowledgeWare Inc.

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CIRCLE 352 ON READER CARD

It wasn't surprising when KnowledgeWare Inc. (Atlanta, Ga.) recently announced support for HP-UX as a target platform for its application development and redeployment tools. The two companies are natural partners.

"Our customers are interested in targeting their applications to platforms other than IBM, and to UNIX in particular," says Mike Ciocia, senior marketing director at KnowledgeWare. "So when HP comes along and says 'We can provide mips at a fraction of the mainframe price,' it's very appealing."

KnowledgeWare's centerpiece product is the Application Development Workbench (ADW), a graphics-based, integrated CASE tool set. A primary feature of the ADW is its encyclopedia, used for centralized intelligent information storage. All information collected throughout the application development life cycle resides in the encyclopedia. This allows automatic transition between the planning, analysis, design and construction phases of application development. Users can focus on business requirements rather than programming technology.

The data and process logic stored in the ADW encyclopedia can be reused for other development projects, or collected independently of a specific platform, then used to develop design specifications and to generate code for different hardware environments.

So, according to Ciocia, you can choose the platform that makes the most sense.

"The ADW provides upper CASE tools for planning and analysis, the encyclopedia for capturing the business model, and code generators for generating the actual application. But the model itself should be platform independent," Ciocia says.

Existing applications can be redeployed with KnowledgeWare's new Northstar re-engineering tool. "This takes an application that was not built in a KnowledgeWare CASE environment, reads the source code and builds a model of that application," Ciocia says. "It reverse engineers application code from an IBM environment into the encyclopedia, then regenerates the new application code."

From HP's point of view, re-deploying an IBM application to an HP platform is important. A customer now has the ability to move old applications to the new platform. "While there are already utilities available that will move an application from IBM Cobol to HP Cobol, Ciocia points out that the ADW encyclopedia offers an advantage they don't have.

"Because we provide the encyclopedia we can bring applications to a higher level of abstraction. Any further development or maintenance of that application takes place at the model level, so the cost of programming and maintenance is kept to a minimum."

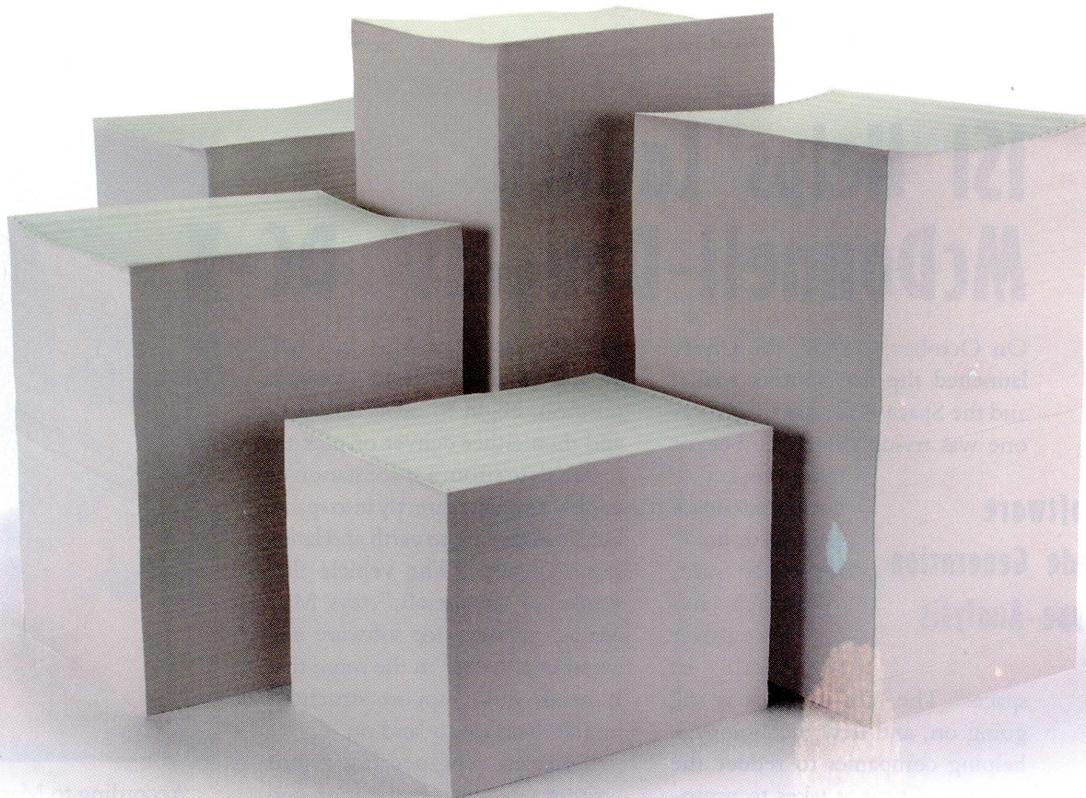
Looking ahead, Ciocia says, KnowledgeWare will support more native UNIX environments. "One of the projects we have on the books is to support Motif as a user interface. We also will support more databases. We support ANSI SQL, Oracle and Sybase already; we will soon support Ingres and DB 6000 as well."

KnowledgeWare's future relationship with HP will involve development platforms for new applications. "We will take the KnowledgeWare tool sets — the actual development tools — and host those directly in an HP environment. So instead of just deploying applications to an HP environment users can develop in an HP environment," Ciocia says.

Ciocia expects most of these plans to be implemented by the end of 1994. "The support for additional databases and Motif is targeted for the middle of the year. Hosting the development platform in an HP environment will be available by the end of the year, but pieces of that — the upper CASE planning and analysis tools — will be delivered in the first half of the year.

"We view HP as an important partner," Ciocia says. "Our market requires that we continue to build and deploy applications where our customers want to go, and they are showing more and more interest in inexpensive UNIX alternative platforms."

—Sam Dickey,
Contributing Editor



Are Your Reports Worth The Paper They're Printed On?

The cost of printing is more than just paper and toner. Time spent handling information becomes a significant part of the equation.

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QUEST SOFTWARE

CIRCLE 175 ON READER CARD



ISI Helps Launch McDonnell-Douglas' DC-X

MATRIXx Software Provides Code Generation And Prototype Analysis

On October 4, 1957, the USSR launched the first sputnik rocket and the Space Race began. Everyone was trying to get the best or fastest rocket or satellite into space first. As John F. Kennedy said, "America has tossed its cap over the wall of space." The race in space is still going on, and new technology is helping companies to reduce the amount of time it takes to prototype new rockets and satellites.

The DC-X Delta Clipper launch vehicle from McDonnell-Douglas Aerospace (MD; Huntington Beach, CA) is a one-third scale model of a payload-capable, de-

partmentalized machine that will be able to take off from a vertical position, begin to orbit the earth and then either deliver or pick up materials to/from a space station or deploy a satellite directly into space, before returning to earth and landing vertically. "The vehicle flies similar to an aircraft," says Matt Maras, manager for software and avionics at MD, "in the sense that it needs little support structures beside a surface to land on."

Software engineering teams writing Guidance Navigation and Control (GN&C) code for the DC-X have achieved significant productivity gains for code created with Integrated Systems Inc.'s (ISI; Santa Clara, Calif.) MATRIXx software development tools.



According to Maras it was necessary for the DC-X to be able to take off and land vertically, relying primarily on four computer-controlled, gimbaled rocket engines, without any ground interface.

continued on page 22

Viking Pump Goes With The HP 3000 Flow

At Viking Pump (Cedar Falls, Iowa), a manufacturer of rotary internal and external gear pumps, there's no such thing as a no man's LAN. All of Viking's employees, customers and distributors have WAN access to its corporate database. With notebook laptops, even mobile workers can telecommute or connect to the network with pocket Ethernet adapters. In other words, everyone can "prime the information pump" at Viking.

It all started three years ago when Joe Welsh, Viking's director of information systems, wanted to provide his users with a common set of integrated software tools. After deciding to replace his aging Honeywell Bull mainframe and investigating "all the major ven-

dors, including IBM mainframes and IBM's AS/400," Welsh decided on two HP 3000s.

An HP 3000 987/150 (upgraded from a Series 949 this past January) runs ASK's MANMAN manufacturing operations software. Welsh describes it as the company's central corporate repository containing product, customer and financial information. "We want to access those through IMAGE/SQL."

About 70 HP Vectra PCs are attached to an HP 3000 Series 937 acting as a file and print server, running HP's version of LAN Manager. While using the SQL capability of IMAGE, Welsh intends to use the PCs as distributed processors. "But our users will be accessing controlled, centralized infor-

mation," says Welsh. For example, Welsh is running HP's ODBC (Open Database Connectivity) driver against IMAGE/SQL and testing Microsoft's Access database and Cognos' Impromptu reporting software. Welsh is also testing HP's OpenDesk as a mail backbone for Lotus' cc:Mail and Microsoft Mail.

The PCs and the two HP 3000s are connected by HP Ethertwist (Ethernet 802.3) LAN spanning three plants in Cedar Falls and one in Windsor, Ontario. The client PCs are now in the process of being upgraded from HP's NS/ARPA to WRQ's 3000 Connection which includes Reflections for Windows. In the next several months, Welsh intends to convert Viking's IS and accounting departments completely

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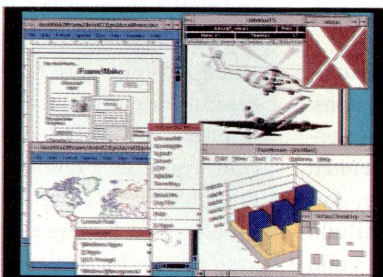


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CIRCLE 156 ON READER CARD

McDonnell-Douglas

continued from page 20

"There would be no remote flying or remote command control, but the vehicle would run an imbedded flight program," Maras says.

Its on-board computer is an Intel i960 RISC-based processor that runs real-time software which incorporates unique control algorithms. These flight and navigation algorithms represent over 30,000 lines of Ada code which were designed and generated using ISI's MATRIXx tool environment.

The tools used include: SystemBuild and SystemBuild Interactive Automation Module for simulation, AutoCode/AutoDoc code and documentation generation tools and AC-100 hardware-in-the-loop prototyping system. SystemBuild uses a set of "primitives" or building blocks which can be assigned tasks from as simple as adding two inputs to get a sum, to more complex activities. Maras says the tools are "intuitive and interactive. It is simple for someone with little experience to use the point-and-click and draw environment."

The SystemBuild application was run on HP 730 workstations. Then a VAX workstation performed an analysis of the generated code to determine efficiency. According to Maras, "SystemBuild provided the mechanics to build the models, but you have to learn how to put the things together for the best results. There are an infinite number of combinations that are possible."

It took 18 months to complete the software and hardware development for the DC-X project. Maras says the ability not only to design a model that could be translated into code, but also to analyze the prototype was a big plus for MATRIXx. According to Diane

Quick, research engineer with the Advanced Systems Group (ASG) at ISI, the real-time controller provided a closed loop run of the flight. Maras agrees that this was an important feature of the software. "We were able to put the developer/system designer in a position where he would be in the loop for the entire time," Maras says. Quick points out that "There are issues

that arise when you go from a simulation situation. [With MATRIXx] users have an idea how it will fit into the system before the hardware arrives. This provides more time for testing, because it is easier to integrate earlier and therefore, save money."

*Deborah Schwartz,
Assistant Editor*

Viking Pump

continued from page 20

to Windows. As part of a three layer networking strategy, Welsh is also deploying Windows for Workgroups 3.11 for peer-to-peer networking in some departments.

Six line printers, most of which are currently connected to DTCs, are being connected to the network using HP JetDirect Cards. With about 25 HP LaserJet III printers already connected to the LAN, Welsh prints everything from letters, purchase orders and invoices, and routes them to the appropriate departments. "It's a tremendous cost saving," Welsh says. Desktop publishing documents can also be printed from an HP 705 workstation running FrameMaker. Although the PCs currently print to a spooler, Welsh wants to make them available to the network printers.

An additional 30 PCs are scattered throughout the company for dial-up access. Using an X.25 board installed in one of the DTCs (with a 19.2 communications link), "we contracted CompuServe for their WAN services," says Welsh. With 30 percent of its sales to customers outside the United States, it's not surprising that Welsh's network "handles over 1,000 connections a month from around the world" as Viking field sales personnel, subsid-


aries, customers and vendors dial in. About 40 of Viking's largest distributors have direct access to the company by calling a local telephone number in their city.

Using Unison-Tymmlabs software, Welsh describes his current IS operation as a "lights out" data center with one part-time weekend operator. Welsh says his biggest problem was solved when he standardized on the TCP/IP protocol. "Being able to find all those pieces and getting them together under a TCP/IP network is the glue that tied it all together."

But getting that glue "to dry" took Welsh about six months of research and deliberation and some consulting with HP. Welsh admits that before, "IS was the bottleneck." Now, IS plays a leading role as an internal facilitator or systems integrator.

"I feel completely comfortable putting a PC on somebody's desk and treat it as an intelligent workstation and based on what [the users] need to do their job, give them the software, as well as give them the nodes and the access to the network for them to get the information they need."

*George A. Thompson,
Technical Editor*



10:04 a.m. - Gary, our response time has slowed from 1 second to 40 seconds.
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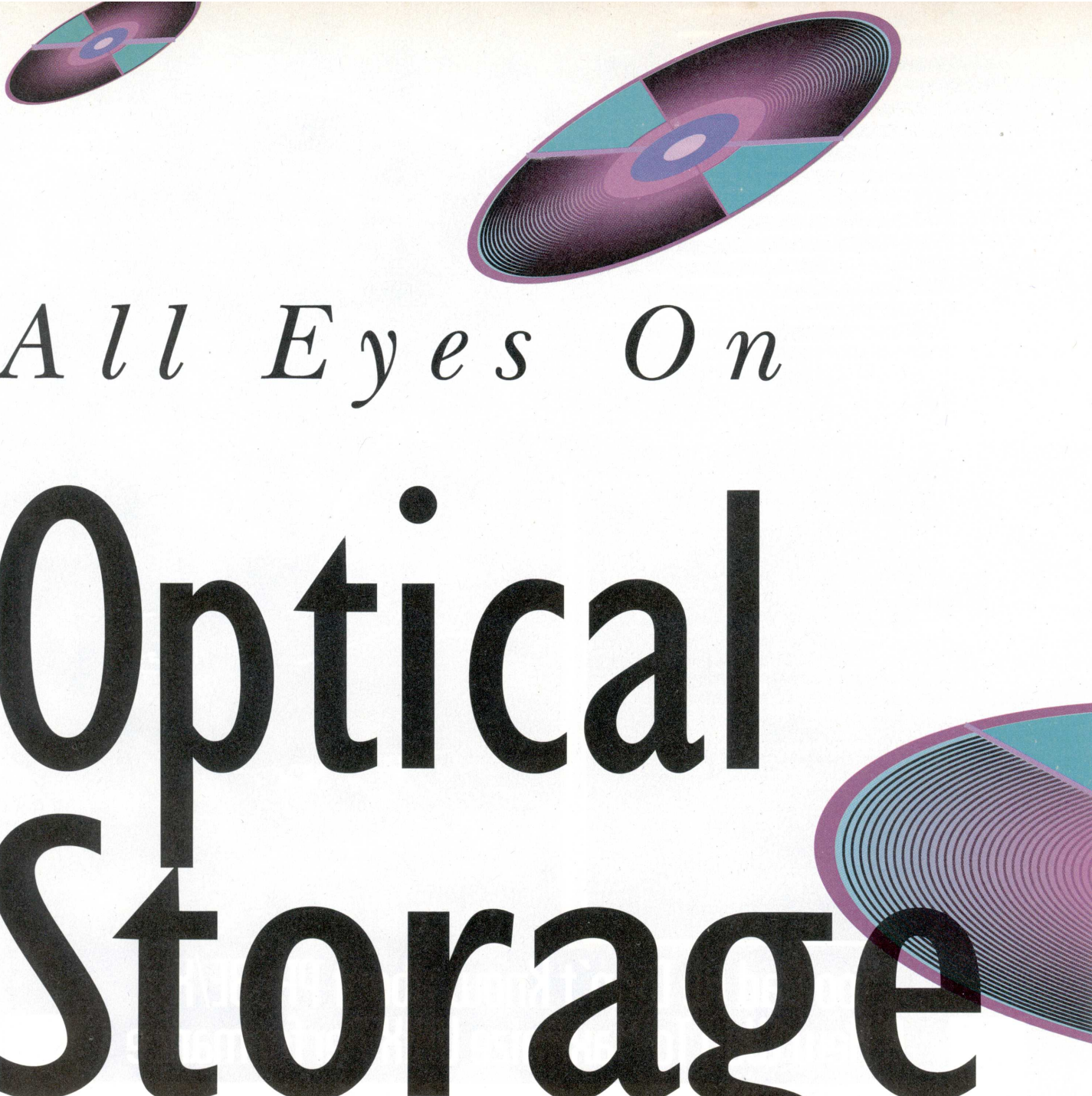


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All Eyes On

Optical Storage

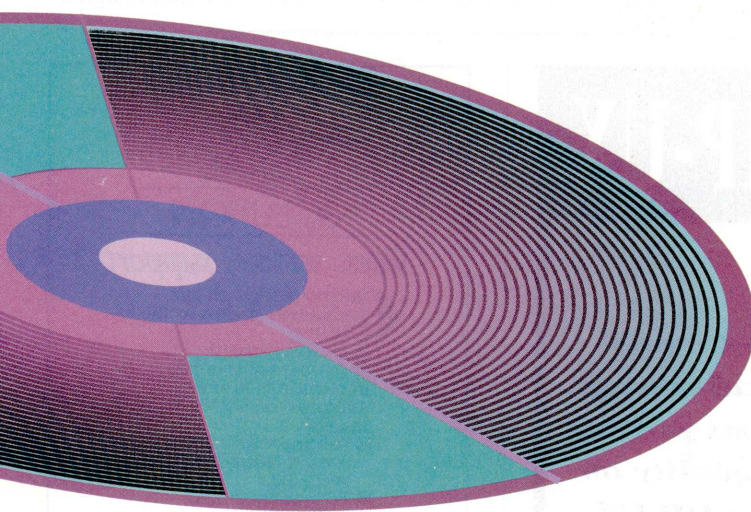
If you're looking for an optical storage solution, there's good news and bad news. Costs are decreasing while capacities are increasing. As you might just have guessed, that's the good news. And just in time too, because individual file sizes are increasing by megabyte leaps and network storage by gigabyte bounds as operating systems and applications become more complex than ever. And then, there's all that mission-critical data and information to store. But it's bad news when the proliferation

of optical storage technologies and solutions leaves you spinning in optical overload. And for IS managers in a quandary over network and client-server implementations, the bad news only multiplies when you begin to consider optical drive jukeboxes and storage management systems.

Fortunately, HP's Greeley Storage Division (GSD) happens to be a leading provider of 5 1/4-inch optical disk drives and optical drive jukeboxes. Like most optical storage vendors, HP

GEORGE A. THOMPSON

Costs Are Down. Capacities Are Up. But Choosing The Right Optical Storage Solution Can Be Difficult



GSD views optical storage as a performance bridge between online disk storage and backup archival tape technology. Optical jukeboxes, when used for near-line storage (i.e., data requiring less than daily access), optical storage solutions provide the ability to store exceedingly large amounts of information in a smaller space, with random data access, and the possibility of reduced administration costs. Optical media will last anywhere from 25 to 50 years or longer, and are unaffected by head crashes and stray magnetic fields.

Because a highly focused laser beam burns a pit into the sur-

face of the disk altering its reflectivity and permanently recording the data, WORM (write once, ready many) disks can't be re-used. That makes WORM storage a popular choice when an audit trail or permanent record is required. Consequently, WORMs have traditionally been used for long-term archival storage and image management. Document management is another good application for WORM, according to Peter Way, product manager at HP GSD. He cites the federal government as a heavy user of WORM storage.

As The WORM Turns

WORM DRIVES HAVE LOST ground to "multifunction" rewritable (or erasable) optical drives using magneto-optical (MO) technology. To record data, the laser in a MO drive heats the optical disk surface to record or change data. When the recording material is heated to approximately 200 degrees Celcius (known as the Curie effect by scientists), the magnetic orientation can be altered easily. A low-power magnetic field then reverses the polarity of the bits in the recording media.

To read a bit of data, a MO drive uses another lower-power laser to reflect light from the magnetized surface, which takes advantage of what is known as the "Kerr Effect." Light reflected from the surface will have its polarity altered by the recording surface's magnetic field, which a sensor detects and interprets as a bit (0 or 1) of data. By automatically recognizing a mark on the media upon insertion, a multifunction optical drive accepts both WORM and rewritable optical disks. In 1989, HP was the first major vendor to offer a rewritable optical disk drive. In 1991, HP developed and licensed the first multifunction MO disk drive. Now Hitachi, Maxoptic, Ricoh and Sony sell optical drives using standard 5 1/4-inch MO technology.

Because rewritable MO optical disks and drives offer all the advantages of WORMs — media longevity and removability, high storage capacity and random access — plus the benefits of erasability, it has become a popular optical storage choice. Since 1991, shipments of WORM drives have been declining and most industry analysts agree that shipments of both 12-inch and 5 1/4-inch WORM drives will be eclipsed by an increasing demand for 5 1/4-inch rewritable optical storage. In 1992, rewritable drives accounted for 91 percent of the optical drives shipped, according to Bob Katze, vice president of Disk/Trend Inc. (Mountain View, Calif.). By 1996, he expects that percentage to increase to 95 percent. As the market leader with over 55 percent of the 5 1/4-inch multifunction optical, HP is focusing its efforts on expanding the market for rewritable optical technology.

"You'll find more data stored on WORMs, than on rewritable, but the growth is in the 5 1/4-inch and 3 1/2-inch rewritable segments," says Mark Harper, director of marketing for Contemporary Cybernetics Group (Newport News, Va.), an optical storage vendor. Other vendors also offering HP-compatible multifunction rewritable optical storage solutions include Concorde Technologies (San Diego, Calif.) and IEM (Fort



Optical Storage

Collins, Colo.). IEM drives, available with HP-IB and SCSI interfaces, offer compatibility with HP 1000, 3000, and 9000 systems. IEM also offers 800 MB WORM drives.

Harper thinks the trade-off is not between WORM and rewritable optical storage, but between 5 1/4-inch and 12-inch media. "If you have a lot of data, you're stuck with WORM; if you have about 200 GB, you might just as well use rewritable, it's the same cost." Harper also notes that rewritable optical, rather than WORM, should appeal to small companies just phasing in new projects.

In 1992, HP introduced one of the industry's highest performance and reliability 5 1/4-inch optical disk drives based on split optical head and all digital signal processor servo systems. Now used in all HP optical libraries, a split optical head moves most of the optical system to a solid mounting elsewhere in the drive, reducing the weight of the read/write head and increasing the speed at which the head can move — reducing seek times.

Pioneer and Panasonic have introduced a rewritable optical drive using phase-change technology, which uses a laser beam to change the recording material from an amorphous state to a crystalline state. However, it is not compatible with the now widely accepted MO technology.

Similar in size and appearance to their ubiquitous audio CD counterparts, CD-ROMs use optical technology to store approximately 650 MB of data (text, audio and graphics) on single 5 1/4-inch polycarbonate disk. CD-ROMs are usually "factory-pressed" by machines onto a "master" disk, then duplicated for reading on CD-ROM drives. With improved access speeds, SCSI-2 standard interfaces and double-speed transfer rates, which further improves performance and throughput, CD-ROMs drives, once considered an expensive high-tech option for PCs, are now being included as standard items on desktop PCs. HP offers CD-ROM drives as an option for its Vectra PCs. PCs and workstations equipped with CD-ROM drives now can move into document imaging or professional-quality desktop publishing.

Commercially available since 1986, CD-ROM technology has evolved with light speed acceleration because of well-established data-format standards that are recognized industry-wide. For example, thanks to the ISO 9660 file system standard, which is operating system-independent, an ISO 9660 formatted disk works the same on a PC, Macintosh, Sun or HP workstation. Other standards include the famous CD-ROM Color Book Standards — Red, Yellow and Green — which describe CD audio, CD-ROM/CD-ROM XA and CD-I technologies,

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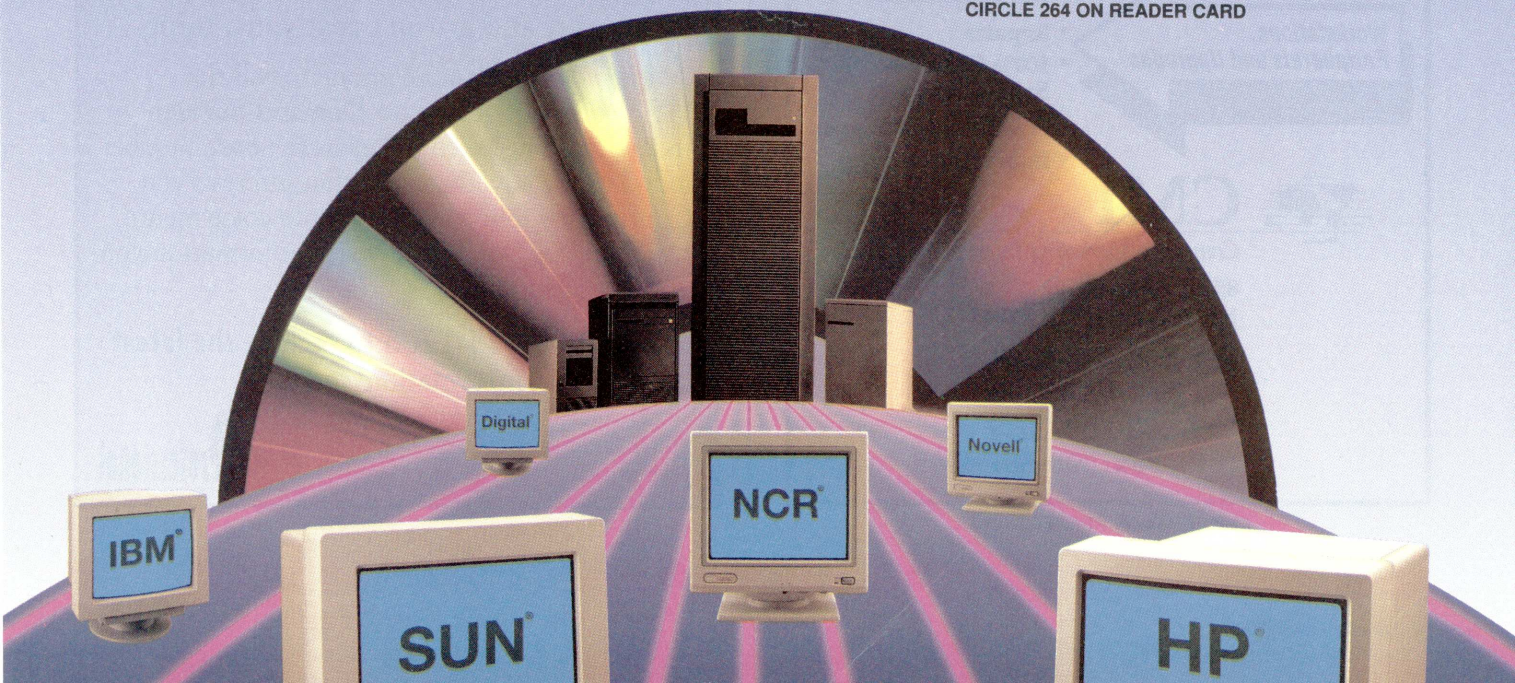


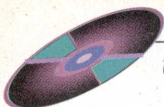
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Optical Storage

respectively. A new color — Orange — is being added to cover magneto optical and CD-Recordable (CD-R) technologies.

CD-ROMs have proved their superiority for distributing software, as well as electronic encyclopedias, clip art, multimedia presentations, magazines, reference titles and various databases of information. According to the latest edition of the *CD-ROM Directory* only 48 CD-ROM titles (including multimedia CDs) were commercially available worldwide in 1986. During the first six months of 1993, over 1,100 new titles were published. And by the end of 1994, over 6,000 titles are projected to be available.

For example, Macmillan New Media (Cambridge, Mass.), a division of Macmillan Inc., is a multimedia publisher of medical, educational and consumer CD-ROM titles. The Wilson Learning Corp. and Sony Electronic Publishing Co. launched an interactive training program in CD-ROM format for businesses.

Laser In A New Light

ONE OF THE MOST PROMISING new varieties of optical technologies is CD-R. By using a laser to burn pits into an

already grooved polycarbonate disk with a gold reflective layer, CD-R systems allow users to create CD-ROMs at their desktops or on their LANs. Expensive mastering and duplicating costs are thereby eliminated. CD-ROM publisher Meridian Data Inc. (Scotts Valley, Calif.), which claims that about 75 percent of all CD-ROM titles originate on Meridian development systems, offers the Personal Scribe 500P (\$6,995), a desktop system for CD-ROM creation. Young Minds Inc. (Redlands, Calif.) offers the CD-Studio (\$18,000), a CD-ROM recorder for UNIX-based systems.

Even the common 3 1/2-inch floppy disk has adopted optical characteristics. As the name implies, floptical technology combines a floppy disk's magnetic recording medium with a CD-ROM's optical tracking system to allow precise and repeatable positioning of the head over the disk. An LED or laser reflects light off of embedded servo tracks providing better feedback for head alignment. This optical servo process provides a greater track density (1,245 tracks per inch) and therefore higher storage capacity than conventional 1.44 MB floppy disks (135 tracks per inch).

Floptical disks usually have capacities of 21 MB, that's more than 14 times the storage of a conventional high density 3 1/2-inch, 1.44 MB disk. By using a "dual-gap" magnetic head,

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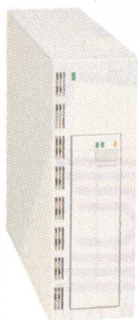
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floptical drives also can read and write standard 3 1/2-inch, 720 KB (1 MB unformatted capacity) and 1.44 MB disks (2 MB unformatted capacity). Floptical storage applications include increased file storage for PC and workstation backups, data transfers and the convenient storage of multi-megabyte graphical, audio and video data.

HP and 3M Corp. recently took part in a joint agreement with Conner Peripherals (Lake Mary, Fla.) where 3M will manufacture and develop a 3 1/2-inch 21 MB floptical disk drive while HP provides the software required to make the Conner SF21e floptical drive (\$900) compatible with HP 9000 Series 700 workstations. With a "dual gap" head, the SF21e can read and write floptical as well as standard 1 MB and 2 MB floppy disk formats.

To ensure the compatibility and interoperability of floptical drives and disks, the Floptical Technology Association (FTA) was founded in 1992 by drive makers Insite Peripherals and Iomega, and media manufacturers 3M Corp., Maxell Corp. and MKE Ltd., a Japanese manufacturer.

Unfortunately, floptical technology has not met with the expectations of its promoters. "The floptical market is in a state of flux," says, Paul Anselmo, optical disk marketing specialist at Maxell (Fair Lawn, N.J.). Disk/Trend's Katzize says "prices

didn't come down fast enough, and because of the explosion of larger capacity files, interest fell short of what users expected for that kind of money."

Check Out Optical Libraries

ALTHOUGH CLIENT-SERVER proponents may claim that less is more, when it comes to optical storage — more is better. And less. That's especially true for optical disk jukeboxes (or libraries) that are capable of storing and accessing many optical disk cartridges. As more optical disks are added, storage capacities can range from 128 MB to more than a terabyte (100 MB) and the cost per megabyte dramatically decreases. In 1992, HP was the worldwide market leader in 5 1/4-inch optical disk jukebox unit sales with 42 percent of the market. Other significant competitors in the market include IDE (35 percent), NKK (13.6 percent), Kodak (3.8 percent) and Panasonic (1.7 percent).

According to Katzize, "HP has a strong position in optical libraries. And they have been very successful in OEMing them to others." Although dollars and densities drive the evolution of optical drive technologies, using optical storage effectively,

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especially on a LAN or in a client-server environment, depends on optical jukeboxes and file management software. "HP 3000 users are definitely interested," says HP's Way, "but there aren't that many solutions available today." Current HP 3000 customers are using HP's TurboStore for high-speed backup, Way says, "but drivers are not out there for optical storage."

Besides ensuring that there is enough empty hard disk space on client machines and servers when necessary, a network manager must ensure that migrating files are stored on the most cost-effective media that is appropriate (dependent on access requirements) and ensure the security and safety of all files through adequate backup and archiving.

Such automated file and storage management have existed for mainframes and minicomputers for quite some time; but until recently most operating systems including MS-DOS, NetWare and UNIX, were predisposed to support magnetic hard disks and did not inherently support optical disk drives. Although these operating systems have gradually added some support for optical drives, specialized or customized software drivers are often necessary. For example, in October 1993, HP working together with Micro Design International Inc. (MDI; Winter Park, Fla.) and Software Architects International (SAI; Bothell, Wash.), announced that its standalone 5 1/4-inch, 1.3 GB optical drive — the Model 1300T — now includes bundled MS-DOS FAT and Macintosh HFS drivers promising plug-and-play compatibility with PCs and Mac systems.

For use on MS-DOS, Macintosh, HP-UX, Sun UNIX,

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Number of Drive(s)	1	1	2	4	4
Access Times	36mm	8 sec.	7 sec.	8 sec.	8 sec.
MTBF	80,000	80,000	80,000	80,000	80,000
Prices	\$3,995	\$10,800	\$23,200	\$55,000	\$70,700

Novell NetWare 3.11 and 4.0 networks, HP also worked with MDI and SAI to provide HP Storage Connectivity Kits. The kits contain cables, documentation and software supporting non-sequential recording (NSR) on HP-UX, SunOS, Macintosh and MS-DOS-based systems. For Novell networks, which do not support NSR, jukebox management software allows you to treat the jukebox as a standard Novell volume.

In April 1993, HP introduced the HP Optical Jukebox Storage Solution (which includes a HP Model 10LC optical jukebox), a complete optical disk library storage system designed to extend the hard-disk storage on a PC-network server running Novell NetWare by up to 10.4 GB.

HP also supplies a rudimentary software driver on all their

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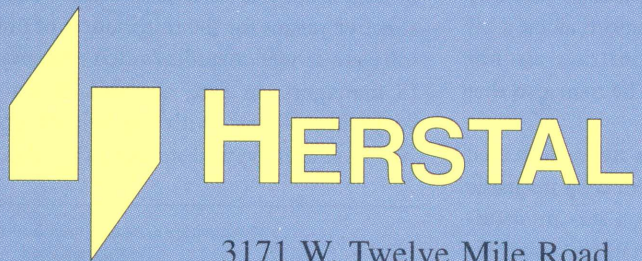
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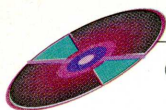
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"Most optical storage systems now on LANs are application-specific; they are not being used as a general LAN resource."

HP-UX systems. "It allows you to mount each of the [disk] surfaces in the jukebox as a file system. So each surface of the platter can be mounted in your file system, then you can build applications on top of that," explains Way. "When you request data, the software takes care of moving the right platter in the jukebox. It's how we sold most of the jukeboxes on HP systems." HP VARs can then add media management applications by using HP's driver.

Hierarchical Storage Management

MEDIA MANAGEMENT IS part of a well-known, but not easily defined concept called Hierarchical Storage Management (HSM). In general, HSM usually includes automatic file migration from disk to optical storage or tape, automatic backup and restore as well as automatic archiving. In practice however, there is no universal agreement about HSM. "There is an enormous amount of talk, but there isn't a common defined set. Everybody has got a slightly different set of needs and wants and expectations," says Harper.

Although there may not be much agreement about HSM, "there is plenty of interest in it, especially at HP," says Way. HP's Network Storage Management Division offers a software product called OmniStore which performs hierarchical storage [including optical] management on the network. According to Way, HSM software works well in applications that use optical storage as a mass storage device. Geographical Information Systems (GIS), oil and gas information, and telephone billing records are examples cited by Way.

In particular he notes AMASS from Advanced Archival Products (AAP; Greenwood Village, Colo.). "By attaching the software to the UNIX file system and making it look like one or more disk volumes, you can run any application, albeit a bit slower, ... [like] database kinds of applications that are not OLTP-oriented. A large historical archive can be managed that way," says Way.

According to Way, the AMASS software takes any records used within files that are used frequently and puts them on a magnetic hard disk. The directory structure and information also are maintained on a magnetic disk. So, any non-data operations comes directly off the hard disk; frequently requested data is also on the

hard disk. Only when other data that hasn't been swapped to the cache is requested, is a swap of a platter necessary. In 1993, AAP introduced AMASS Data-Mgr layered upon AMASS. It provides magnetic disk space for clients and servers.

AMASS also is bundled with optical storage systems sold by Vanguard Technology (Englewood, Colo.). Vanguard provides the storage server, a HP 9000 Series 700 or 800 workstation configured with a magnetic cache disk and the AMASS virtual file system software. Artecon (Carlsbad, Calif.) introduced FileTrek, a client-server-based distributed HSM system which is available for all their multifunction optical jukeboxes running on SPARC and HP 9000 systems. Computer Upgrade (Carona, Calif.) also offers HSM solutions for HP-UX as well IBM AIX, Sun Solaris, MS-DOS and OS/2, offering optical libraries with storage from 3.2 GB to 1.3 terabytes. In September 1993, NETstor (Burnsville, Minn.), announced an OEM agreement with HP to integrate their HSM software with HP's OpenView suite of products. NETstor also provides HSM software for the HP 9000 Series 700 workstations to resellers.

In the past few years, optical technology has found its way into a variety of niche applications. Harper estimates that 80 percent to 90 percent of optical storage is used for imaging applications. Imaging is a broad category including collection and storage of insurance claim forms, medical records, satellite data, X-rays, CAD drawings as well as document management. Way agrees, "Most optical storage systems now on LANs are application-specific; they are not being used as a general LAN resource."

Despite generally accepted standards for media (ANSI, ECMA and ISO/IEC), Harper says the optical storage market is fragmented. "It's not that people are not conforming to standards, there just aren't any." Consequently, many optical storage solutions are proprietary. Harper's looking for a couple of strong vendors to emerge, "to get away from the customized solution."

Optical storage is not going to replace conventional magnetic hard disks any time soon. Hard disk drives still hold a performance edge. But there shouldn't be any doubt that as prices continue to go down and capacities go up, optical storage is an attractive opportunity allowing you to maintain direct access to an almost infinite amount of data and information at a mere \$2 per megabyte.

WORM has proven indispensable for those with a need to record information permanently. Workstations in CAD/CAM environments equipped with floptical drives can have gigabytes of data accessible in seconds. CD-ROMs have proven a cost-effective means for the distribution of published information and software as well as audio/video presentations. Some innovative IS managers, in fact, are already on their way to creating "paperless offices" with the help of optical storage. Any way you look at it, optical storage is a technology for our times.

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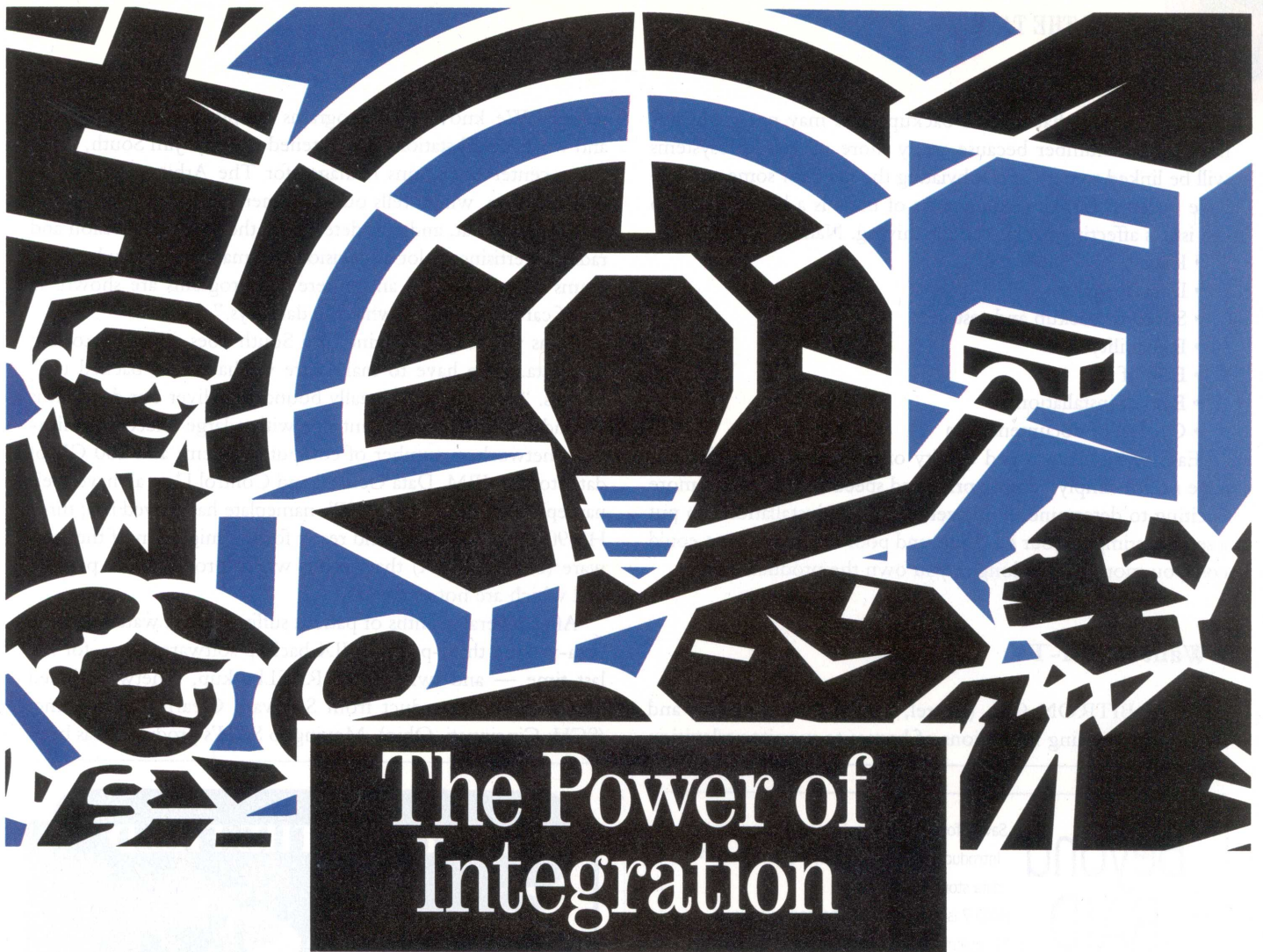
TALES OF THE TAPE

Backup And Archiving
Means Good Business For
UNIX Software Vendors
And Users

Backup and archiving are hardly new computing concerns for most IS managers. But within the UNIX market, backup and archiving software for UNIX and UNIX networks are showing significant growth. "Many users are backing up on the network, and buying fewer tape drives," says Stan Corker, director of removable storage research for International Data Corp. (IDC; Framingham, Mass.).

According to Corker, more automated features will show up this year, as companies add value to backup and archiving systems with automation software for tape libraries and auto-loaders. "Computer manufacturers are shipping fewer backup systems because after-market companies are recognizing the backup needs of users and are providing better solutions."

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TALES OF THE TAPE

Corker notes that sales of backup units may not grow significantly in number because many more of these subsystems will be linked to networks, obviating the need for some smaller-scale systems. But the experiences of users is a better guide to the issues affecting backup and archiving. Namely,

- Price
- Data integrity
- Speed of backup and restore
- Reliability
- Ease of use
- Ease of installation
- Quality of documentation

Ease of installation and quality of documentation often escape notice simply because price and speed are easier and more exciting to determine. However, a difficult installation can put a serious crimp in your schedule; and poor documentation could cost you money for as long as you own the product.

I Want My M-TV

THE ARBITRON CO. (Laurel, Md.) uses TV diaries and electronic sampling in millions of homes to monitor television

habits. "We know what programs people watched last night and what [radio] stations they listened to," says Jim South, computer center operations manager for The Arbitron Co. "We edit that data, which tells our customers who was watching or listening to what, and that determines the cost of television and radio advertising. A lot of decisions are made, such as what programs remain on TV and where the programs are shown. A lot of careers hinge on what the data says."

So as you might imagine, Jim South does not want to lose that data. "We have to make sure we have data backed up," he says. "We are contractually bound to deliver our data." It is an undertaking of significant size with a large telecommunications network, a number of computer systems and 200 GB of data storage. IBM, Data General and Control Data all have their nameplates harbored here. HP's nameplate has arrived too; three HP 9000/897 systems stand ready for the migration of the software (onto HP-UX) that counts which programs are popular and which are not.

After several months of patient suffering, Jim watched some beta-version third-party UNIX backup software fail — for the last time — and switched to REELbackup, a network-based UNIX backup product from Software Clearing House Inc. (SCH; Cincinnati, Ohio). Moving to SCH's product, "has been

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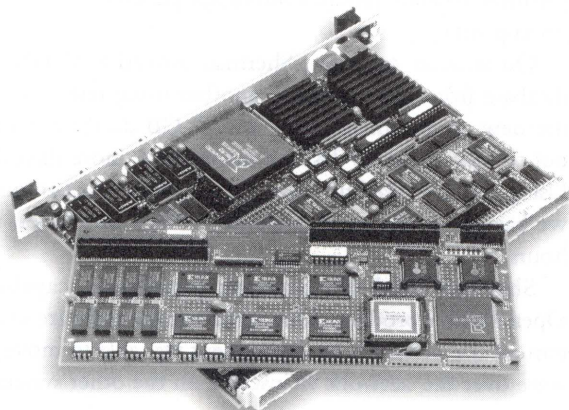
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Much of the business world is headed in the same direction, where backup is becoming a big time obligation.

very smooth by comparison," says South. "It uses the same archive and catalog procedures as on the larger computers."

South is quick to accept some of the blame for temporary troubles in getting comfortable with UNIX systems due to the computer team's lack of experience with UNIX. "Within six months, we'll be comfortable with how we are managing the new UNIX machines," says South. "We need to apply the same data center strategies as we do on the larger systems." His advice to others moving down the same road is to find users who have already successfully done what you are about to attempt and "find out how they did it."

South is hardly alone in having crucial obligations to meet, while trying to speed up systems and control costs. Much of the business world is headed in the same direction that South is — backup is becoming a big time obligation.

Staking Out A Claim

GENE SVENSON, COMPUTER operations supervisor at Redwood Computer Service Center (Santa Rosa, Calif.), a medical claims processing service, looked at more solutions to the problem than just the software alone. Redwood stuffs an endless stream of medical claims forms into 17 GB of storage capacity while running its business on an HP 3000/987 with customized MPE software.

The volume of electronic forms is so great that some processes run all night. If a failure during the night stops this process, recovery without a backup system "can cost six to eight hours of programmer time, and might mean that 30 to 40 people can't get their work done the next day," says Svenson. "Backup is a matter of necessity. We can't function without it."

Unfortunately, the necessity of backup was beginning to get in the way of daily work. Using the standard HP Store (included with the HP 3000), backup was taking more time than Svenson could afford: "The length of time for a backup was exceeding a full operator shift — we were going up to 8.5 hours for a full backup and that was with 12 GB of storage online."

Solving the problem, however, took more than just a software change. Upgrading from an HP 3000 Series 960 to a Series 987 helped. "That saved more than an hour of backup time," says Svenson. Moving to backup software from Uni-

son-Tymlabs (Sunnyvale, Calif) was another big change. Svenson initially used Backpack, then moved to RoadRunner, the new version of that software. RoadRunner provides the simultaneous use of two tape drives, cutting backup time in half, while a 4 to 1 compression ratio slashed the number of tapes used. Backups now take 2 1/2 hours for 17 GB of data.

Consequently, the person responsible for performing once-a-week backups can do something else besides backing up data for a full shift. In addition, the quality of backup improved. "The operator is not as pressed to get things done fast, so there is sufficient time to make sure the backup runs correctly," says Svenson.

Finally, online backups with RoadRunner (a feature provided by other vendors as well), allows workers to do their jobs at the same time a backup is taking place. Rather than making everyone stop working for hours while backing up files, Svenson now asks people to take a break for a few minutes while RoadRunner identifies the current status of all the files to be backed up. Files are backed up showing their status at the point in time the backup order was placed, he says. "The online feature seemed pricey at first, but it will pay for itself in about 18 months."

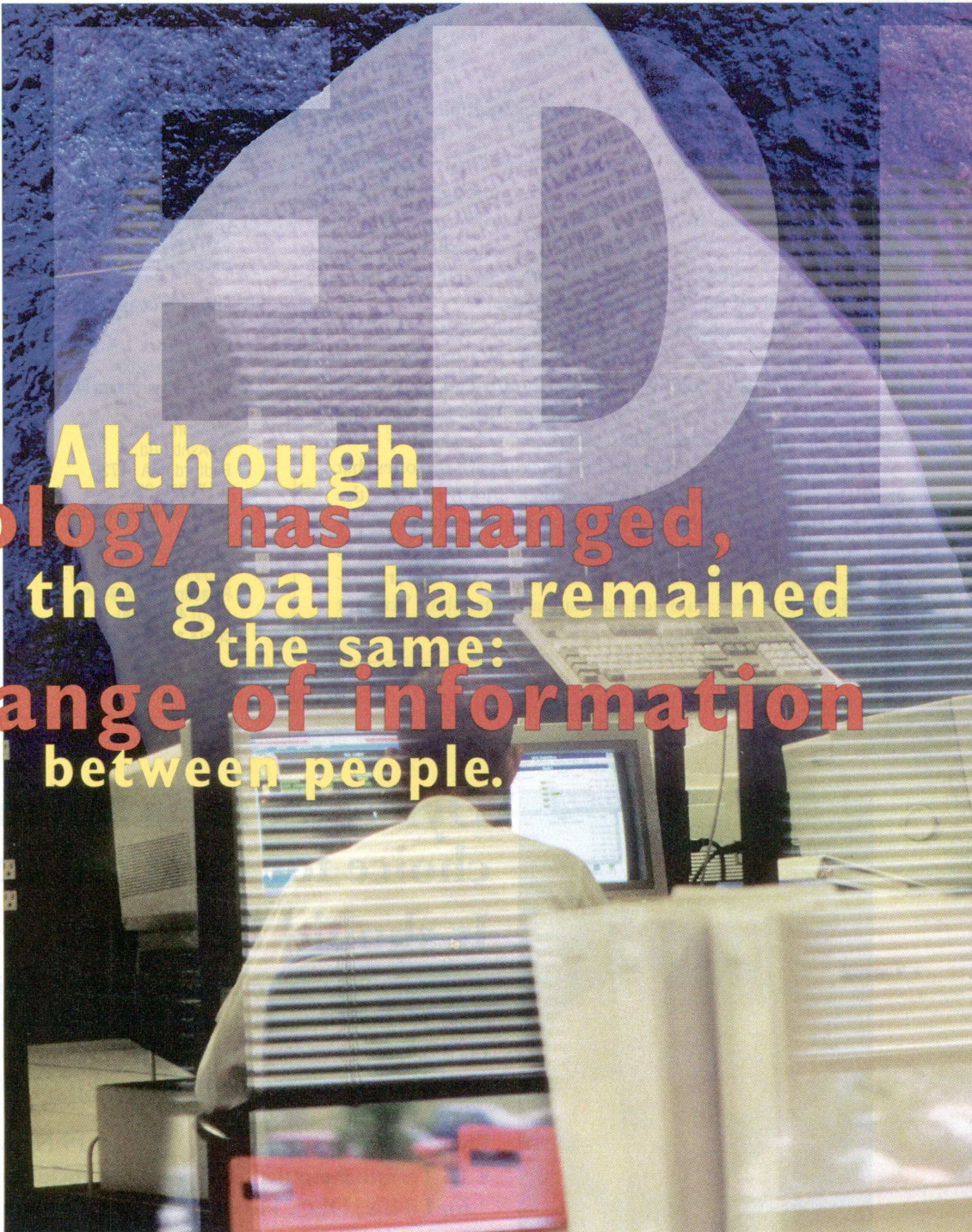
Another RoadRunner user is Jerry Commisso, manager of information technology for Reliance Electric Co. (Cleveland, Ohio), a maker of industrial machines including electric motors and drive systems. Commisso is pleased because RoadRunner "Does what they said it would do, it's easy to use and it's competitively priced." His three networked HP 3000s are now all backed up in about two hours.

Recently, however, a channel adapter failed and "fried" an HP disk drive. Despite HP's quick repair of the drive, Commisso says their "data was Swiss cheese." Commisso recalls the incident with dread; "Reloads in the past were never any fun." To his surprise, the reload took the same length of time as the backup — two hours. He advises buyers to check not only backup time, but the reload time of potential products.

John Sherman, data center manager for Millipore Corp. (Bedford, Mass.), a maker of separation and filtration equipment, runs along the leading edge of new technologies. His computing environment includes an IBM 4381 and HP 3000 proprietary system that his department is retiring, as well as HP 9000, Sequent and Sun systems with UNIX. "We rely heavily on backup for our storage management," says Sherman. His department recently rebuilt a multigigabyte Oracle 7 database from backup data.

On another occasion, Sherman moved a 17 GB Oracle 7 database from one system to another using restore to establish the new environment. "For our 17 GB database, writing that out to tape using UNIX commands took more than 24 hours. Using OpenV*Backup from OpenVision [Pleasanton, Calif.], we backed up the same database to 8mm tape in less than five hours."

Sherman used the network installation capabilities of OpenVision's product. After installing the software on one system on the network, his department was able to move the software over the network to install it on the other systems on the



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Sherman also turned to OpenVision for its archive software, OpenV*Archive. "We needed a solution to manage an Oracle database, and there is no tool yet from Oracle for purging and archiving that data." On a regular basis, his department purges data, places it in temporary tables for storage on tape and catalogs it for restore if they are ever needed again.

"We are one of the few users who take this software [Oracle System 7] into a production environment. We have constant changes, so we take daily, weekly and month-end backups to ensure data integrity, security and to archive data for reporting to both internal and external customers."

Perhaps it can be said that the best backups are the ones that are never needed. Such a saying could be mounted over the HP 9000 systems at Arbitron. Nearly a year after their installation, they have never faltered. "But on our other systems, it has saved us," South says. "Backup is a critical part of our business. Without it we could be in a boatload of trouble. You just have to commit the resources."

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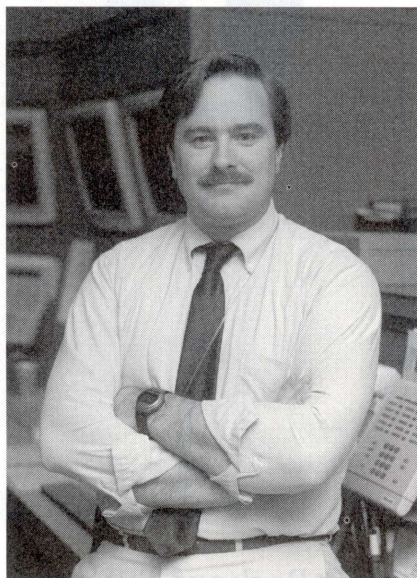
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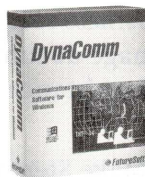
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Initiating Changes

If you're using Microsoft Windows, you are probably already

familiar with the two primary Windows control files — WIN.INI and SYSTEM.INI. Because these files are so critical to Windows' operation — in addition to general system information, a number of applications also store data in these files — Microsoft has encouraged developers to use "private" .INI files. Consequently, more developers are finally beginning to use .INI files in the Windows directory rather than adding new lines to the existing shared control files.

With the introduction of Windows 3.1, both the File Manager and the Program Manager use private files named WINFILE.INI and PROGMAN.INI, respectively. The WINFILE.INI file contains the settings that customize the File Manager while the PROGMAN.INI file contains the settings that customize the Program Manager.

If part of your job is to help users keep their Windows working properly, then you should know that there is a modifiable section in each of these files that restricts what a user can or cannot do during a Windows session.

Of course, before you modify any .INI file, you always make backup copies.

After you have copied your original WINFILE.INI and PROGMAN.INI, open PROGMAN.INI. At the end of the

file, add a section name called [Restrictions]. A typical [Restrictions] section is shown in Figure 1.

Figure 1

```
[Restrictions]
NoRun=1
NoSaveSettings=1
EditLevel=2
```

PROGMAN.INI RESTRICTIONS

The documented valid entries in the [Restrictions] section of PROGMAN.INI can include the following keywords and their associated meanings.

NoRun=0|1 This parameter defines whether the Program Manager [File|Run] menu is enabled (0) or disabled (1). Users are unable to run any application not already installed in a Program Manager group, and are unable to install new software.

NoClose=0|1 This parameter defines whether the [File|Exit] menu is enabled (0) or disabled (1). Disabling the [File|Exit] menu selection also disables the Control Menu [Close] selection, and disables the [Alt]+[F4] exit sequence. The only way a user can exit Windows with this parameter set to 1 is to reboot the system.

Note: Be sure you have access to an editor in a program manager group before you set this parameter, or you will have to reboot to get out of Windows.

NoSaveSettings=0|1 Setting this parameter to 1 disables the [Options|Save Settings on Exit] menu. Any changes the user makes in the positioning of group windows, and program or file icons will not be saved. The default state, 0, enables the menu selection and forces windows to respect the setting of the SaveSetting parameter elsewhere in PROGMAN.INI.



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NoFileMenu=0|1 The NoFileMenu parameter enables (0) or disables (1) the entire File menu selection in Program Manager. However, unlike other options in [Restrictions], users can still open, move, copy, delete and set properties of groups and icons using the keystroke combinations and the mouse. They also can exit Windows using the Control Menu [Close]

selection unless NoExit is also enabled.

EditLevel=0|1|2|3|4 The EditLevel parameter lets you define what ability users have to change the Program Manager groups, programs and data files.

When set to 0, the default, the user can make changes. Whether the changes persist in subsequent Windows sessions depends on state of the other [Restrictions].

When set to 1, the File menu New, Move, Copy and Delete selections are disabled whenever a Program manager group is selected. The keystroke combinations do not work either. Thus, the user can't make changes to the existing groups.

When EditLevel is 2, the Editlevel 1 restrictions apply, and also include program and data file items. The user, cannot make changes to groups or to individual items. EditLevel 3 includes the previous level restrictions, and disables changes to the Command Line in the Properties menu.

Finally, EditLevel 4 includes all of the previous restrictions, and also prevents the user from changing the Properties including the application name, icon and description. Note: it does not disable viewing of the Properties dialog box.

You can see how these restrictions help prevent novice users from hopelessly changing their Windows desktop.

WINFILE.INI RESTRICTIONS

You can add a [Restrictions] section to WINFILE.INI as well. Unlike the PROGMAN.INI file, there is only a single documented entry in WINFILE: NoShareCommand. Figure 2 shows a typical WINFILE.INI [Restrictions] section.

Figure 2

```
[Restrictions]
NoShareCommand=1
```

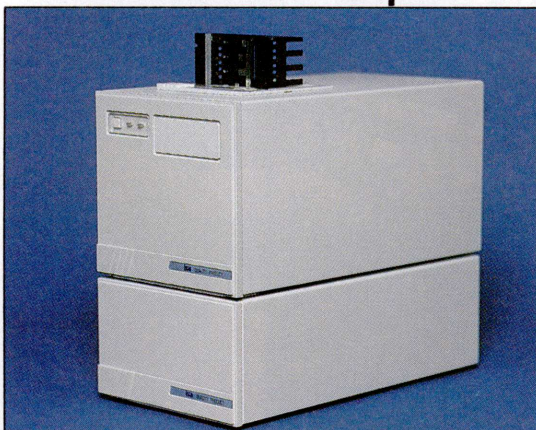
If you use Windows for WorkGroups, you know that you can specify directories as shared among other workgroup users using a File Manager menu. But if you don't want a user to be able to modify the shared directories in use, you can disable the File Manager menu selection by setting NoShareCommand to 1. Omitting the [Restrictions] section, or setting NoShareCommand to 0 (the default), allows the user to add or delete shared directories using the File Manager menus.

Careful experimentation is the key. So, tune your users' Windows environments for maximum productivity while minimizing the time you spend protecting them from Windows' sometimes unfriendly behavior.

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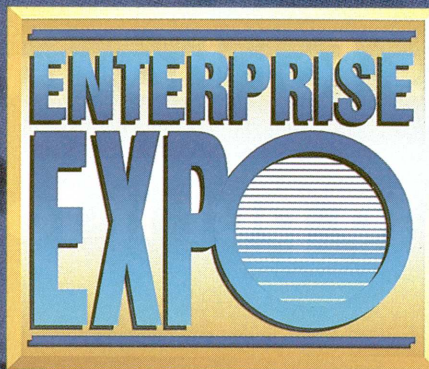
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The Who, What, Where Of UNIX

I've been getting a lot of abuse lately (but admins thrive on it). When I

was speaking during a general session at the InterWorks SYS_ADMIN conference in November, someone told me to shut up. So I did. I also got some abuse about this column. It seems many people want me to include the kind of eclectic tidbits that were in this column once before. So I will.

WHO AM I REALLY?

Sometimes it's really difficult to understand English, especially if it's on the page of a UNIX manual. For example, the **whoami** command is described as doing the following: "print effective current user ID." It goes on: "prints your current user name, even if you have used **su** to change it." On the other hand, the **who** command is described like this: "When invoked with the 'am i' or 'am I' option, identifies the invoking user."

So, with that in mind do this:

```
# su fredm
$ who
root console Dec 3 09:19
root tty1 Dec 3 09:19
root tty2 Dec 3 09:19
$ whoami
fredm
$ who am i
root tty1 Dec 3 09:19
$ who am I
root tty1 Dec 3 09:19
```

Now tell me, why did the **whoami** command report my effective user ID, as

expected, but **who am i** does not identify the invoking user? It's a pain to me that **whoami** and **who am i** do two different things. Of course, the real UNIX weenies out there will tell me that's because **who** uses the `/etc/utmp` file and it doesn't see **su**

WHERE AM I?

Many sites would like to use the automounter with NIS distributed maps, but still want to control which file servers are used on different machines. This can be done with a local file as a map, but a better method is available.

At the conference, an admin told me that she sets an ENV variable at boot time in the rc files for specific machines, or groups of machines, to a host name to be used. Then by using that in the map, she controls access. For example, let's assume that games are an important part of a company's medical plan. We must all play games at least one hour a day. Because many people could be accessing these file servers for the games at the same time, this could be a problem. Therefore, a line like this in our automounter map would not be good:

```
/usr/game fs1:/usr/games fs2:/usr/games
```

All machines would try to access fs1 first. Only if fs1 is unavailable would we try to access fs2. This also doesn't take into account where the file server is located. A better way of sending out a universal map, but still maintaining local control over it, would look like this:

```
/usr/games $GAMES1:/usr/games $GAMES2:/usr/games
```

Then, in the system rc files, I would define the GAMES variable. On machines

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I want to use fs1 primarily:

```
export GAMES1=fs1 GAMES2=fs2
```

On machines I want to use fs2 primarily:

```
export GAMES1=fs2 GAMES2=fs1
```

Now why didn't I think of that ... don't answer that.

WHAT'S YOUR NAME?

I get asked quite often about files with weird characters in their name. Usually, people want to delete them. I prefer to rename them, unless I know they contain junk.

One easy way to create files with "unprintable" names is with most any X widget or dialog box filename prompt. Try it with *vuepad*. Do a save-as and enter some control characters. Note that *vuepad* does the correct thing by showing some symbols to represent the characters. For example a CTRL-C in the pathname field is displayed as

```
e t x
```

This is a nice feature, as it would be rather dumb-userish to ignore that and create the file anyway; other tools don't show the characters, so it is easy to get weird names. OK, now that we got one, how do we see what it really is?

There are several ways; one is to use the little known **-q** option of *ls*:

```
# ls
what has some spaces two
# ls -l
what
has some spaces
normal
two
# ls -q
??what has some spaces two
#
```

Here we see that non-printing characters are shown with **?**. That can be handy, we also see the **-l** option to look for leading or embedded spaces. For trailing spaces, use the following:

```
# ls | rev
tahw
secaps emos sah
lamron
owt
#
```

There are other methods of accessing weird names. If it's a text file, use "open" in *vuepad*'s file menu. Once you select a

file from the list of filenames, the "file to open" field shows some symbol for the non-printing characters. It does not show the space characters though.

To get a look at the real characters, use the following old standby:

```
# od -c
0000000 \0 001 203 321 \0 \f \0 001 . \0 \0 \0 \0 001 \ 301
0000016 \0 \f \0 002 . . \0 \0 \0 001 203 322 \0 020 \0 006
0000032 n o r m a l \0 \0 \0 001 203 323 \0 $ \0 017
0000048 h a s s o m e s p a c e s \0
0000064 \0 \0 \0 \0 \0 \f \0 003 t w o \0 \0 001 203 325
0000080 \0 020 \0 006 003 004 w h a t \0 \0 \0 001 203 324
0000096 003 244 \0 005 t w o \0 \0 \0 \0 \0 \0 \0
0000112 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0 \0
*
0001024
#
```

Once you know how many spaces are in the name, you can easily move the file:

```
mv 'two' better_name
```

Non-printing files are more difficult to deal with. If it's a text file, you can use *vuepad* to call it; then, save-as to rename it. This also works with the file manager; it does a good job of showing non-printing characters. But, real SYS_ADMINS don't use the file manager. Right?

Other methods include using the **-i** option to *ls* to find the inode number, then using **Bfind** to rename it. Remember the file that looks like "what" really has two special characters embedded in it:

```
# ls -li
99285 what 99283 has some spaces
99284 two
# find . -inum 99285 -exec mv {} better_name \;
```

Then again, I remember tracking down a problem that a backup script was having when passing pathnames. As it turned out, it wasn't a problem with the script; it was just a file with embedded non-printing characters in a user's home directory.

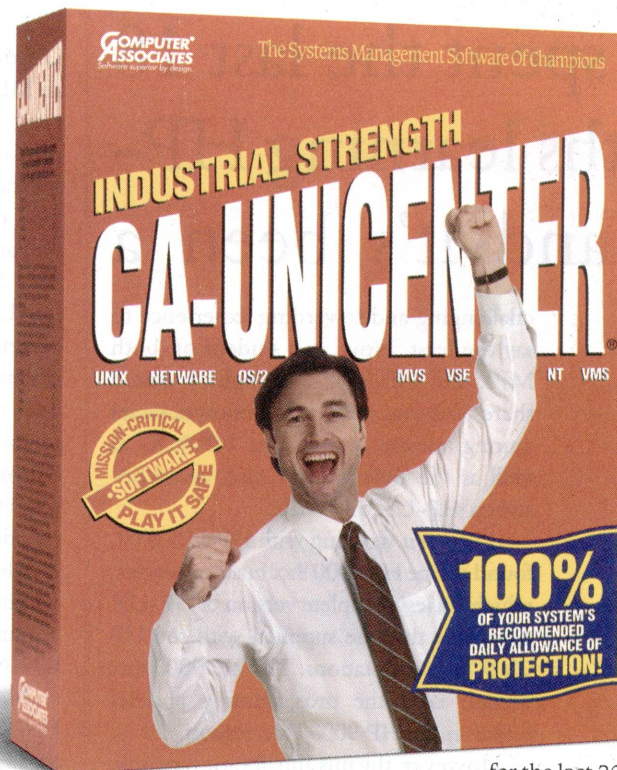
Being a nice guy, I went and fixed the file by renaming it. I notified the user by E-mail. The next morning, my login E-mail check singed the hair on my eyelids. The user adopted that naming method to protect his personal files to keep admins from rooting around.

Oh, well...

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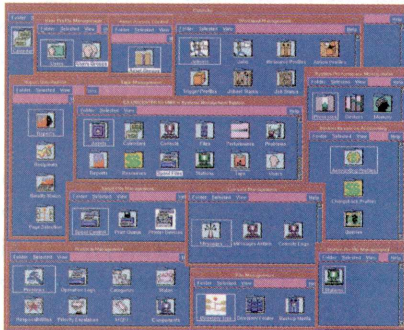
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CIRCLE 296 ON READER CARD

Two Schools Of Thought

I have spent the last 18 months learning HP-UX and it's been a

challenging and rewarding experience to say the least. Now, as a student of both MPE and HP-UX, I thought I would share with you some of the idiosyncracies among various versions of HP-UX, as well as the differences I discovered between HP-UX and MPE.

I've been working with HP-UX 8.02, found on the HP 9000 8xx business servers, which is a less complete version of HP-UX 8.07 than the one supplied with the HP 9000 7xx workstations. The HP 9000 8xx version lacks the programming libraries found in the HP 9000 7xx version.

However, the missing libraries are only a concern if you are doing serious program development or wish to install some of the many programs available on the Internet. If you require them, you can specify these libraries when ordering your system. While you're at it, you may want to order the full C compiler as well.

After reading the manuals, and spending a few dollars on the O'Reilly & Associates, Nutshell books, I was able to use many of the network programs. Telnet, ftp, bootp and XDM (for X Terminals) worked as advertised. I did find out that NFS only works one way, unless you purchase an additional software option. You can mount remote file systems, but they cannot mount your disks unless you have that software option installed.

Don't expect a print spooler in HP-UX that is anything like the one found on an MPE machine. If you need a powerful print spooler, then you should look at third-party software products. There are several products available, but only one or two of them, such as Unispool from Holland House and Easy Spooler from Seay Systems will run standalone on an HP-UX system. Unfortunately, most currently require the use of an MPE machine as the master spoolfile controller.

A remote printing feature lets you use printers attached to other systems. The remote line printer daemon, passes your requests through the network from its psuedo-printer to the remote systems spooler, where it prints the information on the defined printer. Of course, this requires the remote system to support UNIX style remote printing.

Novell supports this style with its FLEX-IP product, and IBM supports it through its TCP/IP products. This feature also allows remote systems to use printers attached to your machine. In fact, one site I work with has one large line printer attached to an HP 9000 8xx system, which also uses 10 other printers that are attached to the Novell print servers.

DIFFERENT LESSONS

One major difference between the MPE and HP-UX systems is found in the MPE **abortjob** command and the HP-UX **kill** command. The **kill** command allows you to send a signal to a process which is executing, in the hopes the process will know what to do with it. The command **kill -15** will send the hangup signal to the process identified by the Process ID number or PIN number in MPE lingo.

If the program was coded correctly, it should respond by gracefully shutting down. My favorite command is **kill -9** as the **-9** option tells the HP-UX kernel to immediately kill the process. There is no graceful shutdown, no cleaning up of file systems, just a sure kill. On the other hand, the MPE **abortjob** command demonstrates a bit more finesse. It cleans up file systems, closes files and then aborts the process.

In MPE, if you accidentally abort someone or their job, chances are you won't really screw things up too bad. The UNIX **kill** command, however, forgives no one. Depending on how your database and application handles processes killed with a **-9**, you could come through unscathed or wind up with a corrupted database. What is the correct way to get rid of hung sessions for your application? Can you use a **kill -15** or do you have to use special database utilities to disconnect the users from the database first?

These questions take on added importance when you use Telnet to access your application. If during the busy time of the day, your LAN goes down, how do you clean up the processes left running without corrupting your application? Unlike using a serial network, you just cannot reconnect to those sessions. If someone knows some black magic to do this, let me know.

To make the above situation slightly more difficult and dangerous, you don't abort all of a user's processes at once by using a single job or session number as in MPE. You must identify and kill all the processes individually. Believe me, there have been times I wished for the equivalent of an MPE **abortjob** command.

Q&Q

Make a checklist of what you do on a day-to-day basis to support your application to measure the candidates for your new application and database. Here are a few questions I wished we had asked.

A user's session is hung, how do we clear it? Is the application being used by other customers via serial terminals, or with Telnet on a LAN? Does the vendor assume a user will always be using a single serial port and is that information used within the application? Telnet ports are pooled resources. You get a different port with every session.

What disk and memory requirements

are required for best performance? How should the database and its log files be split up across the disks for maximum performance? This answer could require the purchase of one or more disk drives that probably are not in your budget.

What will be most important to you, will be how well it all fits together in the day-to-day application environment. Even

if it is the best application in the world, is it worth using if it requires constant hand holding?

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CIRCLE 163 ON READER CARD

“Killer” Software

You may not know it, but software can kill. Eugene Smith of

Doylestown, Pa. was declared “dead” by software. A driver’s licensing database insists he died in a traffic accident. He has spent nearly three years trying to get reinstated through the Pennsylvania state computer system. But, the software is designed so that once you are dead—you stay dead. In Canada and England, people “died” from overdoses of “therapeutic” radiation due to software errors. Most passenger aircrafts are designed around the notion of “fly by wire,” or in other words, “We’re betting your life on the software.” A software flaw is allegedly suspected to have contributed to the fatal Boeing 767 accident in Thailand.

Other incidences of “killer” software include: A feature in a 911 emergency system that routed firefighters to a wrong address resulted in fatalities. And a numeric accuracy problem in Patriot missile software, apparently resulted in the deaths of a barrack of U.S. servicemen.

As more safety-critical systems begin to rely on software, software risk and failure are major issues to be considered in today’s society. For several years, Peter Neumann of SRI International (Menlo Park, Calif.) has taken responsibility for documenting the public risks associated with computing. He writes a regular feature, “Risks To The Public In Comput-

ing and Related Systems,” for the Association for Computing Machinery’s (ACM) special interest group on software engineering (SigSoft). Some of Neumann’s anecdotes are amusing. Some are lethal. Most are accidents. Others are deliberate fraud.

Funny Money

Financial losses because of software defects are an international problem. As institutions become dependent on electronic funds transfer, the software itself becomes more complex. Individual programmers have taken advantage of this complexity by concealing code in programs that transfer minute amounts from individual transactions to their own accounts. What’s the true magnitude of the financial shrinkage due to faulty software controls? No one knows.

I once worked on a redesign of a retail accounting system in which the original version included a well-coded module for detecting data entry errors. The errors were dutifully rejected, but the original design did not include a provision to guarantee their re-entry. The documents containing the incorrect entries could languish for months (or forever) before someone acted on them.

The 1992 version of a widely-used tax accounting software package contained a defect which failed to properly deduct state tax relative to federal tax, and incorrectly computed foreign tax credits. Packaged software is one of the few products sold with a routine disclaimer on the package: To paraphrase, “If this product doesn’t work, or wrecks your business, we abandon all responsibility for it.”

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In the past, disk storage customers have been forced to make compromises, choosing systems that met only some of their requirements. Over the past 20 years, the performance of central processing units (CPUs) and Random Access Memory (RAM) has increased at a rate of 40% to 100% each year. During the same period, disk storage doubled in capacity while cost was reduced 50% every three years. Unfortunately, due to their electromechanical design, disk storage performance (seek time, rotation latency and data transfer rate) improved less than 50% in the last decade. This gap in CPU and memory vs. disk input/output performance creates a limiting factor for today's computer system.

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The issue is not, "Will the software fail?"
It will fail. Rather the issue becomes "fail safe"
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CIRCLE 472 ON READER CARD

Sometimes a software defect is intentional. For example, a Manhattan software contractor, was fined \$25,000 for putting a "bug" in the software of a law firm. According to the judgement, the contractor put a statement in the program to make it abort when the system reached case number 56789. He planned for the system to fail so the law firm would retain him to fix it for a hefty fee. He was nabbed by the law. But another consultant earned \$7,000 to repair the software.

Friend Or Fraud

The Federal government encourages fraud by refusing to enforce the original law restricting the use of the Social Security Number (SSN). Computer crime is often linked to an abuse of SSNs as an identifier. Banks, credit bureaus and anyone else issuing credit use a SSN. Of course, if you want credit, you don't complain that it's illegal. However, when someone else fraudulently uses your SSN, it is called a "computer error."

Neumann documents cases where people use a fraudulent SSN to get driver's licenses in Virginia, set up charge accounts with those licenses, then bilk the system of millions of dollars. A software system at Indiana University Medical Center cleverly grouped all null SSN's (SSN = 0) under the name of a nine-month old infant and made her responsible for the bills of 37 other patients.

Rolling The Dice

Many software organizations operate on the premise of, "Get it out the door now. We can fix the bugs in the next release." Frequently, the compilers and operating systems, used to create software contain known defects. Developers program around such defects to avoid propagating new errors. The issue is not, "Will the software fail?" It will fail. Rather, the issue becomes "fail safe" or "fail secure."

Yet the overriding issue for many software organizations is cost rather than reliability. Software developers are constrained by budgets that limits focus on quality. Some managers believe that CASE will help, but CASE often makes it possible to construct bad systems faster rather than engineer better quality software.

Few programmers have a software

engineering education. The majority are programmers with little formal software education beyond their first programming language and operating system.

Software engineering education is scarce. There are less than 20 universities with a graduate software engineering program. None offers an undergraduate degree. There are a few industry software engineering courses and these are directed toward large corporate and government software organizations.

Cutting Your Loses

Although risk management should be an integral part of every software project plan, it seldom is. A quality assurance program is also essential for improving safety and security. Start using the "structured-walkthrough" method NOW.

Never rely on the same person to design and code a set of programs. Put a configuration management program in place, automated if possible, to track every change to every new software release.

Send your senior people to software engineering seminars or conduct them in-house. Learn about new approaches to software engineering through associations such as the ACM's SigSoft.

Study the benefits of various design methods such as object-oriented design, data-oriented design and data-flow design. Evaluate the potential of newer languages such as C++, Eiffel and Ada. Pre-stressed C++ template "classes" often can ensure improved quality, and Ada actually includes a "Safety and Security" annex as part of the new standard. Look at the programming languages you learned in the past. Many have new standards that include improved support for quality.

Safety and security can be important selling features in your software. As you improve the safety of your software, let your clients know about it. For example, the mistakes released in MS-DOS 6.0 have been turned into a financial opportunity by several software companies. Microsoft, itself, is making a few bucks with MS-DOS 6.2, correcting their earlier errors.

There is a growing public awareness of the importance of software as more people use microcomputers at home and at work. They are beginning to realize that what you call a "bug," is just a euphemism for

your own mistake. A bug is an unexpected event or entity that invades your program from outside. A mistake is a mistake. Try not to say "bug" when you mean mistake.

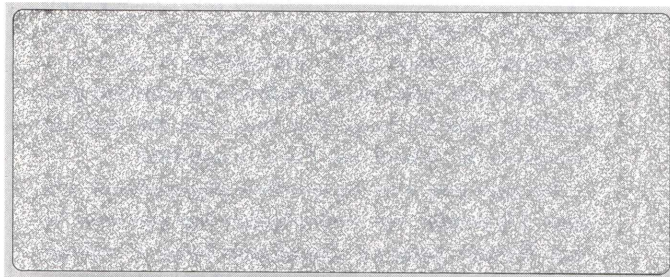
Then consider the risk next time you board an airplane. Software flies the plane. Software navigates the plane. Wouldn't it be nice if the software kept your plane

from bumping into some other plane?

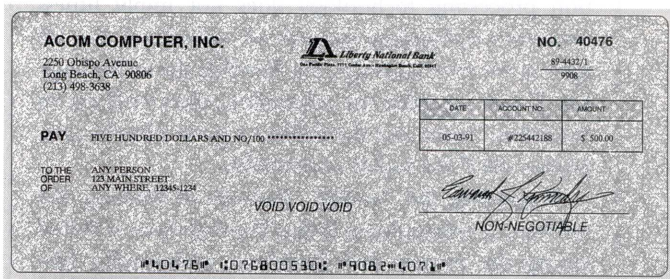
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riehler@ajpo.sei.cmu.edu.

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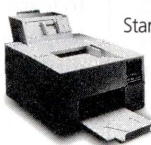
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View From Another Side

The November 1993 editorial was a stunning piece of hi-tech corporate introspection. And long overdue.

But what *really* impressed me to no end was how *really great* your hair looks in the photo!

The whole corporate/capitalist system is built around a promise of interminable (capital) growth. If people sought to bring their corporate lives into tune with their personal values, they'd probably spend less time at the office and make their newfound heightened productivity earn it's keep. But that's not the way the system works. Somehow, I'm not surprised.

Because you seem to question conventional wisdom, I'll ponder out loud whether our post-war hi-tech Welfare program (Manhattan Project, military research, SDI, etc.) has fostered an illusion that silicon spells "productivity." The survival of rarefied information processing technology does not imply fitness when that technology is massively subsidized. But I'll answer my own question; the fact that the technology has (if you'll pardon the expression) bled itself out of the defense arena into the civilian, I guess it has by now proven itself as a viable commodity.

Regarding the "sordid" business of farming out software construction to India. The real threat is that of raising the notion that American white-collar bit-twiddlers might not actually be worth every penny we presently pay them; at least within the context of an expanding global economy.

So we have demands for greater productivity — greater per-hour productivity, while staunchly maintaining the standard 8+ hour day — from the bosses, and the threat of hungry talent overseas chipping away at the foundations of our vaunted top-ticket value. What's a self-respecting bit-twiddler to do? Twiddle something else for a change? Do you think there's a glut of bit twiddlers in America? To hear tell, you'd think there was an alarming paucity!

Ron A. Zajac
Member of Scientific Staff
Bell-Northern Research

Women In The Workforce

In the October 1993 Industry Watch column, Bill Sharp complained about the lack of women running divisions at HP. I notice that, of the 16 editors listed in your magazine, only three are women. If you are really concerned about the representation of women in the

workplace, you and five of your fellow male editors will immediately resign to allow for the proper representation of women on your magazine. If you fail to do this, then I will consider you the "all talk, no action" type of liberal who feels self-fulfilled by telling others what to do.

Remember, for every slot you guarantee to a woman, you guarantee that a man won't have it. This quota system not only hurts a company, but the loyal, qualified people who work there. Women should get the positions they qualify for at HP just like they should at your magazine. Competition helps business, quotas hurt it.

Ed Granger
Kansas City, Mo.

Neither HP Professional, nor myself, advocate "quota" hiring. However, I support recognizing and using talent when talent exists. Incidentally, all editors at HP Professional report to Publisher Leslie Ringe. If you check the masthead of personnel involved with the production of HP Professional, you'll see that women comprise about 40 percent of the listed staff.—BS

Programming In Ada

I was pleased to find an article on Ada in the October 1993 issue. The author feels Ada takes longer to learn than other languages. I disagree. Ada *may* take longer to master, but not longer to learn. I don't think the cost of personnel training of Ada is higher than C or C++. I think compiler and tool costs are prohibitive factors. It is important for every programmer/software engineer to learn Ada even if they choose to program in another language. I am confident learning Ada can improve the quality of code written in C.

B.G. Mahesh
Software Engineer
EVB Software Engineering Inc.

HP Professional welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to HP Professional, 101 Witmer Rd., Horsham, PA 19044. Fax number: (215) 957-1050. Internet address for staff listed on the masthead: LASTNAME@CARDINAL.COM.

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Either Way You Win.

CIRCLE 458 ON READER CARD

new Products

MiniStor And Hitachi Announce Partnership

MiniStor Peripherals Corp. and Hitachi Ltd. announced that the two companies have entered into a technology license and development cooperation agreement for the future production of high-capacity rugged disk drives for use in mobile computers.

Under the terms of the agreement, MiniStor will provide Hitachi with an unrestricted license of its proprietary 1.8-inch hard disk drive technology. This includes licensing of MiniStor's ImpacSAFE advanced shock sensing technology.

In addition, Hitachi and MiniStor will immediately begin the joint development of a new family of high-capacity 2.5-inch disk drives that will be manufactured by Hitachi and marketed by both companies. Contact MiniStor Peripherals Corp., 2801 Orchard Pkwy., San Jose, CA 95134; (408) 943-0165.

Circle 400 on reader card

HP Introduces HP ScanJet IIcx

HP introduced ScanJet IIcx high-performance color and grayscale flatbed scanner.

The ScanJet IIcx scanner enables business and technical users to produce crisp, professional-quality documents quickly and economically.

The ScanJet IIcx scanner boosts finished document quality through 1,600 dpi enhanced resolutions and 400 dpi optical resolution for image and text scanning. It features 8-second grayscale scanning.

ScanJet IIcx comes with HP DeskScan II Version 2.0 scanning software. Users can automatically scan hardcopy images, such as photographs, directly into HP DeskScan II 2.0 via the automatic document feeder (ADF) for hands-free scanning. With PC-fax applications that support TWAIN, users can employ the ADF and HP DeskScan II 2.0 to send hardcopy faxes via PC fax cards.

The HP ScanJet IIcx scanner costs \$1,179

and an optional 50-page automatic document feeder costs \$559.

Extended Systems Supports Wireless Connections

Extended Systems announced support for wireless infrared connections for the HP OmniBook 425. Extended Systems' JetEye PC provides a point-and-shoot connection between the OmniBook and any DOS-compatible desktop or portable computer.

The JetEye PC ESI-9610A uses the LabLink Remote Access software included with the OmniBook to establish a wireless connection with the desktop computer and allows access to local floppy and hard drives or printers.

Supporting HP's serial infrared (SIR) technology specifications, the JetEye PC transfers files at 115.2 Kbps. Both the OmniBook 425 and the OmniBook 300 superportables are supported.

The JetEye PC ESI-9610A costs \$149. Contact Extended Systems, 5777 N. Meeker Ave., Boise, ID 83704; (208) 322-7575.

Circle 398 on reader card

Equinox Enhances Communications Servers

Equinox introduced an enhancement to its ELS series of multiprotocol Ethernet communications servers. With Release 3.04 of the ELS operating software, custom menus can be built for each user, or for groups of users, on the network server. User menus allow a single keystroke to perform connection requests to TCP/IP or LAT hosts and to permit complex commands to be simply executed. In addition, the menus can be used as a security checkpoint to limit user access to a specific community of hosts and services or commands.

Equinox ELS servers permit serial devices such as terminals, modems and printers to be networked to host computer systems or workstations running the TCP/IP, LAT or IPX protocols. They are compatible with

HP-UX, SCO UNIX, SVR4 UNIX, Novell UnixWare, Sun Solaris, VMS and Ultrix operating systems.

The series includes the ELS-8, ELS-16 and the expandable ELS-48. All feature custom RISC processors, flash ROM operation, built-in parallel ports, and thick or thin Ethernet interfaces.

The ELS-8 costs \$1,795, the ELS-16 costs \$1,995 and the ELS-48 costs \$2,400. Contact Equinox, 6851 W. Sunrise Blvd., Ft. Lauderdale, FL 33313; (800) 275-3500.

Circle 397 on reader card

DCI Provides UNIX Migration Solution

Development Concepts Inc. (DCI) released their line of 5250 Twinax Controllers and Twinax Terminal Servers, which have been expanded to include support for HP 9000 Series 800 systems and for remote installations.

Available in two- and four-port models, the DCI controller products support up to 14 or 28 Twinax devices, respectively, and come complete with system software. An HP 9000 Series 800 can support up to 16 DCI HP/5250 cards.

Price is \$3,000 for the two-port card and \$3,900 for the four-port card.

Contact DCI, 730-D Louis Dr., Warminster, PA 18974-2829; (215) 443-9652.

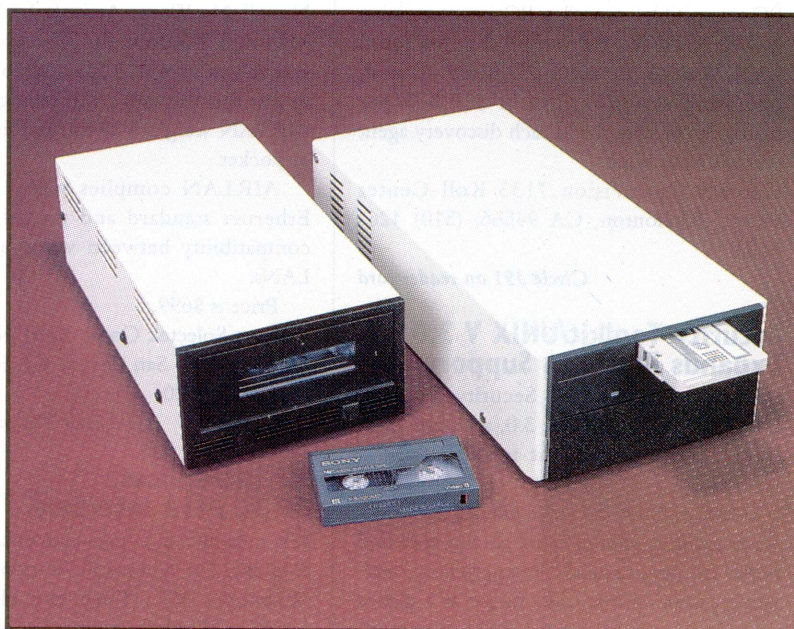
Circle 395 on reader card

DISC Expands Omnindex Support

Dynamic Information Systems Corp. (DISC) expanded the support of Omnindex, a database indexing systems, to include DEC's Rdb relational database and a broader implementation of Oracle support.

Omnindex is a software indexing system that provides improved retrieval performance for a variety of existing databases. It has full multiple keyword indexing, which allows users to search for information based on any number of selection criteria.

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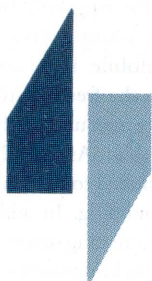
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Oracle and Rdb databases join RMS, flat files and IMAGE as supported data structures. Omnindex is platform and database-independent. Records are qualified at up to a quarter million records per second. Omnindex is available for HP 3000, HP-UX, DEC VMS, SCO UNIX, IBM RS/6000 and DEC Alpha. Prices range from \$9,000 to \$57,000, depending on CPU. Contact DISC, 5753 Central Ave., Boulder, CO 80301; (303) 444-4000.

Circle 394 on reader card

SAS Institute Ships SAS/CPE Software

SAS Institute Inc. shipped a system and network performance analysis tool for open systems.

SAS/CPE software for Open Systems is a specialized tool for managing and analyzing UNIX systems and networks. The software runs under HP-UX, Sun Solaris and IBM AIX operating systems.

SAS/CPE software for Open Systems supports data collected from HP Performance Collection Software, Sun Connect's SunNet Manager, Cabletron Systems' Spectrum, UNIX Accounting Data, Landmark Systems' Probe/X and ProbeNet or Concord Communications' TRAKKER. The software takes the data collected by these products and creates a performance database and front-ends analysis, reporting and reduction of data.

This software is a data management, analysis and presentation system designed to facilitate the operation, monitoring and asset management of distributed computer systems. It also provides analytical and reporting tools for organizations to spot trends, patterns, problem areas and bottlenecks in a network.

Cost is \$2,940.

Contact SAS Institute Inc., SAS Campus Dr., Cary, NC 27513; (919) 677-8000.

Circle 393 on reader card

OpenVision Tracks PCs And UNIX Systems

OpenVision introduced a solution that automates the discovery of asset data on PCs and UNIX systems. OpenV*Assets helps organizations control hardware and software costs and plan for the future by providing complete, up-to-date details on all their current information system assets.

OpenV*Assets collects the hardware, software, vendor, configuration, financial and purchasing information needed, logically groups it in modules and presents the data in configurable views for secure but easy access.

OpenV*Assets discovery agents are available for HP 9000 Series 700/800 systems

running HP-UX, Sun/OS or Solaris, IBM RS/6000 workstations with AIX and IBM PC-compatibles, as well as PC servers running Novell NetWare, Banyan VINES, Microsoft LAN Manager or other PC-based network operating systems. Cost is \$10,000 per management station and each discovery agent costs \$49 per node.

Contact OpenVision 7133 Koll Center Pkwy., Pleasanton, CA 94566; (510) 426-6400.

Circle 391 on reader card

Security Toolkit/UNIX V 3.0 Expands Platform Support

Raxco Inc. announced Security Toolkit/UNIX (STK/U) version 3.0, a comprehensive security assessment tool for UNIX systems.

Version 3.0 of STK/U offers a network-wide security summary of all the specified hosts. An easy-to-read "green, yellow, red" rating system allows users to see at a glance whether any security problems were discovered. Also included are numeric ratings which can be used to gauge improvements in system security. In addition, a new "File Access" module has been added which allows system administrators to display users having access to a list of user-specified critical files. Also featured are a remote installation mode, modeless dialog boxes, lists of users with .rhosts and .netrc files and host level summaries and reports.

Ported to the HP 9000 Series 300/400/700/800, Sun3, Sun4, Solaris, DEC RISC and VAX Ultrix platforms and IBM's RS/6000 running AIX, version 3.0 contains features to allow sites to develop a baseline for their UNIX systems security.

Prices range between \$250 and \$9,790, depending on platform.

Contact Raxco Inc., 2440 Research Blvd., Rockville, MD 20850; (301) 258-2620.

Circle 390 on reader card

AIRLAN/PCMCIA Gives Plug-And-Play Mobility

Soltek Corp. introduced AIRLAN/PCMCIA, the newest member of its AIRLAN wireless Ethernet product family. Designed for use with PCMCIA equipped notebook computers, AIRLAN makes possible mobile LAN connections which allow users the freedom to move about their workplace unencumbered by power cords or network cables. As a result, users are capable of staying linked to the LAN while they roam within a building. In addition, AIRLAN is ideally for creating entire wireless LANs or temporary field networks.

AIRLAN operates at 2 Mbps and supports all major network operating systems including Novell NetWare, Artisoft LANtastic and Microsoft Windows for Workgroups. It uses spread-spectrum 915 MHz radio technology to pass data through walls, ceilings and floors. AIRLAN weighs 5.25 oz. and fits in a purse or pocket.

AIRLAN complies with IEEE 802.3 Ethernet standard and provides seamless compatibility between wired and wireless LANs.

Price is \$699.

Contact Soltek Corp., 6370 Nancy Ridge Dr., Ste. 109, San Diego, CA 92121-3212; (619) 450-1220.

Circle 388 on reader card

HP Introduces HP 82341A Interface

HP introduced a high-performance HP-IB interface for Microsoft Windows 3.1 and Windows NT. With the HP 82341A interface, Windows users can acquire data and control test-and-measurement instruments from Intel-based PC platforms. The interface includes HP's standard instrument control library with a high-speed interface card.

Using the HP 82341A interface, engineers can write C or C++ programs to import data into their Windows applications from any test-and-measurement instrument with an IEEE 488.2 interface. These instruments include oscilloscopes, function/waveform generators, network and signal analyzers, counters, multimeters and VXI-based instruments.

The HP 82341A interface card uses one standard ISA/EISA bus slot, making it compatible with most PCs. Price for the HP 82341A interface for Windows 3.1 is \$495, for the Option NT is \$845 and for the Option NTI is \$350.

Tektronix Adds Printer To Dye Sublimation Line

Tektronix announced the Phaser 480, a full bleed 11- x 17-inch dye sublimation color printer. The Phaser 480 is optimized for fast, photographic-quality color output for a workgroup environment.

The Phaser 480 prints at speeds similar to direct-connect, dedicated raster printers, yet retains the versatility provided by PostScript Level 2.

The Phaser 480 handles several graphic arts and scientific/engineering applications including layout comps, pre-film color proofing, image analysis and data interpretation.

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Maestro for UNIX enables systems managers or administrators to automate network job scheduling, tracking, and monitoring to increase throughput and reduce processing errors. It can schedule jobs anywhere on your network according to customized business calendars, in addition to date, day of the week, and time.

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Maestro runs in AIX, HP-UX, Sun Solaris, NCR, and HP-MPE environments, and on heterogeneous networks.

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and AppleTalk ports are standard, with automatic intelligent switching among ports and protocols to support multiple platforms and protocol environments. EtherTalk, Novell NetWare and TCP/IP network connectivity are available as options.

The Phaser 480 uses a .AMD 24 MHz-29000 RISC processor for fast throughput. Base memory configuration is 32 MB expandable to 64 MB in 16 MB increments. Price is \$14,995.

Contact Tektronix Inc., P.O. Box 1000, MS 63-583, Wilsonville, OR 97070; (800) 835-6100.

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TARDIS Produces 3D Stereograms

TARDIS Systems announced the availability of SIRDS, which creates 3D stereograms that can be viewed without special glasses or complicated mirror systems.

SIRDS are single-image random-dot stereograms. They are a full 3D picture contained within a single frame.

It contains its own miniature CAD 3D object-modelling system and runs under

protected mode employing full 32-bit processing for fast-optimal stereogram generation.

SIRDS version 1.2 runs on any 386 or 486 PC with a VGA monitor and 4 MB of extended memory.

Contact TARDIS Systems, 901 18th St., Ste. 301, Los Alamos, NM 87544; (505) 662-9401.

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KnowledgeNet Provides Net/Wrk For VMS and HP

KnowledgeNet announced Net/Wrk VMS and Net/WrkHP. Both products provide seamless integration between DEC VAX platforms running VMS, and HP platforms running HP-UX, as well as between VMS and HP-UX platforms and AS/400-, OS/2, RS/6000- or S/36-based platforms running KnowledgeNet's other Net/Wrk products.

Net/Wrk VMS and Net/WrkHP operate across APPC/APPN and TCP/IP backbones using a simple command language. Users can engage in bi-directional file transfer and remote program execution across similar and dissimilar hardware platforms. Both versions

also support dynamic SQL for accessing and updating subsets of data on remote workstations.

Net/Wrk Scheduler lets programmers schedule unattended execution of all network functions and the API Toolkit which lets them embed Net/Wrk VMS and Net/Wrk HP commands into existing applications.

Contact KnowledgeNet, 1260 W. Northeast Hwy., Palatine, IL 60067; (708) 705-0400.

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Intelligent Interfaces Offers VR option

Intelligent Interfaces announced the availability of the Variable Resolution (VR) option for the MicroPrint 45 CXA HP-IB to Centronics Interface Converter. It provides a new option that eliminates the output problem of illegibly small or too large, off-the-page graphics when using HP-IB computers and ATE (automatic test equipment) with HP Centronics printers.

In addition to connecting Centronics printers, HP computers and ATE with HP-IB (IEEE 488) interfaces, the VR option allows owners of HP printers with Centronics

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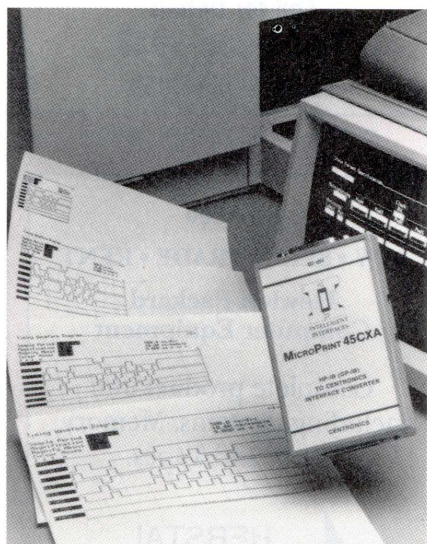
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The VR option allows users to control and pre-set size and resolution.

Century Computing Releases TAE Plus For HP 9000/700s

Century Computing Inc. announced the release of TAE Plus software for the HP 9000 Series 700 workstations supporting the HP-UX 9.0 operating system. This version of TAE Plus also supports the generation of user interface code in Ada, C and C++. TAE Plus version 5.3 is a portable software development environment that supplies development tools for creating sophisticated GUIs and management tools for controlling the application's user interface at runtime.

TAE Plus version 5.3 was developed for application developers, human factors specialists and graphic artists who design and build GUIs for products or for internal corporate use.

TAE Plus version 5.3 offers the following features: the TAE Plus Workbench, which allows a developer to lay out an interface interactively and intuitively; code generator and code merger, which generates the

required user interface code in C, C++ or Ada; dynamic data objects (DDOs), which allows the designer to create truly graphical interfaces that use dials, gauges, pictures, maps, switches, icons or animation to communicate with users; rapid prototyping, which allows the developer to generate prototype interfaces, and test and refine them to find the design that best meets the user's needs; and automated scripting, which provides the capability for automated testing, online demos, tutorials and usability testing.

Contact Century Computing Inc., 1014 West St., Laurel, MD 20707; (301) 953-3330.

Circle 379 on reader card

Sterling Software Supports HP 3000

Sterling Software Inc. announced that it intends to port GENTRAN:Basic, its EDI management software, to the HP 3000 platform. GENTRAN:Basic provides comprehensive capabilities for managing the electronic transfer of preformatted business documents — such as purchase orders or bills of lading — between trading partners.

GENTRAN:Basic for the HP 3000, which fully complies with the POSIX application portability standards, supports all major global EDI standards. In addition, the menu-driven application contains powerful job-scheduling, online auditing, error-control and detailed reporting features that make it easy to use and dramatically speeds EDI implementation in customer organizations.

Contact Sterling Software, 4600 Lakehurst Court, P.O. Box 7160, Dublin, OH 43017-0760; (614) 793-7000.

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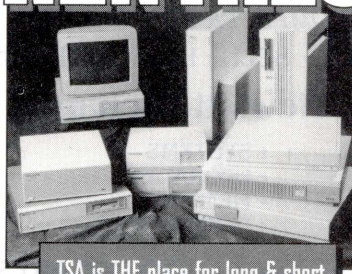
HP Offers COBOL SoftBench And COBOL/C SoftBench

HP introduced the COBOL SoftBench and COBOL/C SoftBench software-development environments that help COBOL programmers make a smooth transition to an open-systems software-development environment. The products are based on SoftBench, the open, integrated CASE environment from HP, and Micro Focus COBOL, COBOL development toolset from Micro Focus.

The COBOL SoftBench toolset includes: the SoftBuild-SoftOption for COBOL; The SoftStatic for COBOL; the SoftDM (development manager) for COBOL; and SQL support for COBOL.

COBOL/C SoftBench features the tools mentioned above, plus a thorough integration of the HP-UX C Developer's Kit, which includes the HP C compiler and the HP/DDE source-level debugger.

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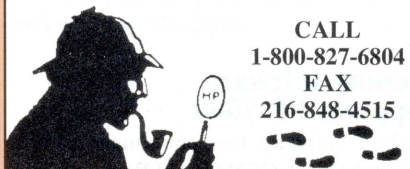
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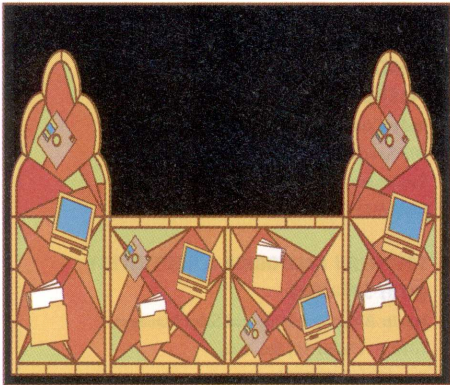
Gothic Re-Engineering



By Gordon
McLachlan

HA! I have to laugh when I hear IS people proclaiming that they are “re-engineering” their systems. Engineering is defined as the practical application of mathematics and physical science. The problem is that systems engineering isn’t nearly as disciplined or as scientific as we think it is. In fact, it strikes me as similar to cathedral building.

The great Gothic cathedrals, built in Europe between the 12th and 16th centuries are indeed impressive. The Gothic architects’ adaptation of the traditional Roman arch and vault, allowed them to reach greater heights, and span greater distances, than previously thought possible.



However, the arch creates an outward pushing force at the base. The higher and wider the arch, the more force it exerts. At some point, the base will give way. The old way of coping with this outward force was to support arches and ceiling vaults with thick, slab walls.

The Gothic architects’ answer to this problem was to use pointed arches, and to add

external bracing — or buttresses — to those arches. This allowed construction of taller structures and extensive use of stained glass instead of slab walls, and resulted in the cathedrals’ characteristic ribbed look.

Yet, that achievement was the by-product of trial and error, not engineering. Lacking the mathematical tools needed to calculate the forces at work on their arches, Gothic architects could only guess at their design limits. And, as the collapse of the cathedral at Beauvais in the late 13th century demonstrated, those guesses weren’t always accurate.

In many ways, systems developers are the Gothic architects of the modern world. With grand dreams

for our creations, we add bracing and pile the stones higher and higher, never knowing if or when they will collapse on us. We can only guess about some of the most fundamental questions: How long will a project take to complete? How much will it cost? How many users can we support?

We don’t even know if our systems will work until they are essentially done, and even then we can’t prove that they work, or will continue to work, we just know that they haven’t collapsed yet. It isn’t a lack of tools that’s holding us back. It’s our lack of a scientific method. Real science requires rigorous discipline — well-designed experiments and careful observation.

We’ve tried with formal development methodologies, metrics, 4GLs, CASE and object-oriented development tools. But, they alone don’t make us engineers — just better-equipped craftsmen.

We’re so eager to start building that we don’t take the time to properly design or document our systems, let alone our methods. We skip from methodology to methodology because something about one of them sounds good or feels right, not because we can prove it works. How many of us take the time to turn our projects into valid experiments?

How many projects have floundered because of the same stupid mistakes that have been made on the thousands of projects that went before? How many deadlines and budgets are blown because we don’t understand what a system is supposed to be, or how we should build it? So, until we start putting some science behind our systems development, it’s hard to see how there can be much engineering going on.

Maybe the day will come when we can actually call ourselves engineers. And then again, maybe not. In the meantime, I suggest we take pleasure in our craft and figure out the best way to use the tools we have to keep building our cathedrals. At least we’ll be getting something done. ■



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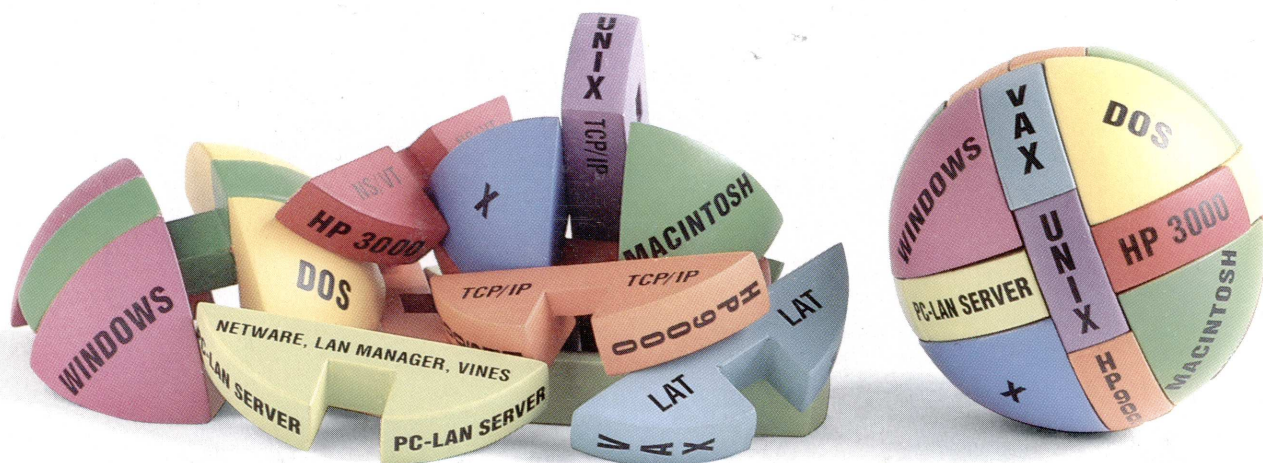
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